

# LYNQ

## Solution Capabilities

PRODUCT VERSION 2019 R1

DOCUMENT REVISION: 1.0

JANUARY 2019

# About LYNQ

Achieving delivery, quality and financial goals relies on the effectiveness of your resources. Getting the most from your employees and machines goes beyond scheduling.

It requires intelligent insight and complete visibility of where time is being lost, using technology that can automate data collection and optimise workflow, to seamlessly connect planning and production activities. LYNQ is

reinventing manufacturing execution system (MES) software for small to midsize manufacturers looking for a configurable, plug-and-play solution to digitalise and drive factory performance.

Formed around international standard IEC62264, LYNQ's all-in-one solution can plan, track, automate, analyse and optimise factories to increase efficiency, productivity and profitability.

## 0 Introduction

1 Advanced Planning & Scheduling

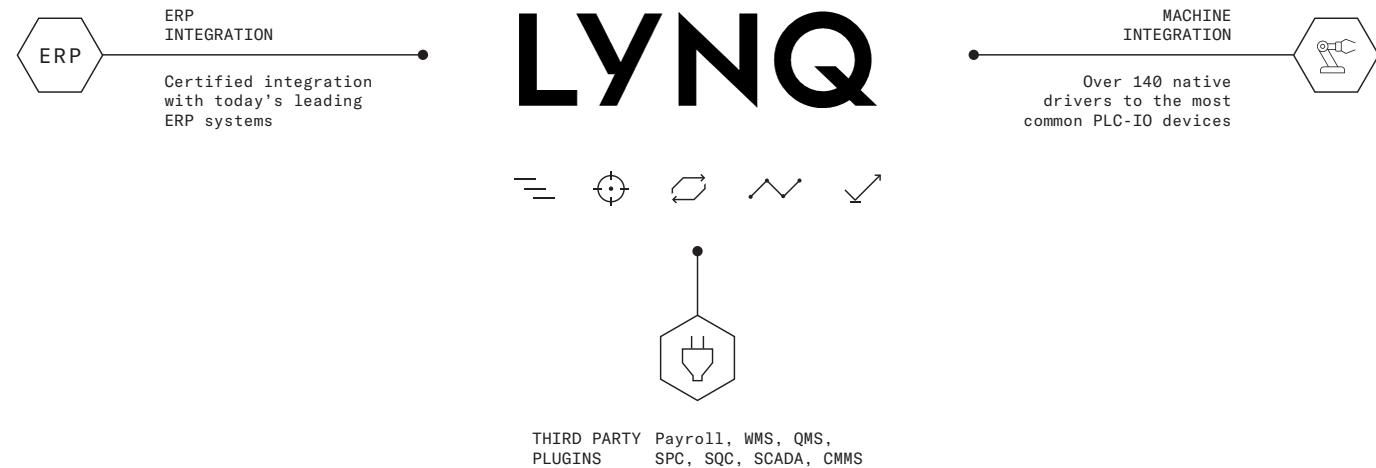
2 Shop Floor Data Collection & Tracking

3 Factory Digitalisation & Automation

4 Factory Performance & Loss Management

5 Factory Collaboration & Paperless Shop

6 Administration, Security & Connectivity



## Core features:

- Designed for job shop, batch production, production line and mixed mode environments
- Closed-loop, fully integrated solution aligned to international standards for manufacturing operations management IEC 66264 and ICO 22400
- Supports Lean Six Sigma manufacturing initiatives and methodology (DMAIC)
- Provides key manufacturing performance indicators and loss analysis out of the box
- Realised as a mobile ready, web application with a powerful desktop-based advanced planning and scheduling (APS) component
- Accessible via any device, anywhere with multi language and multi time zone support
- Supports touch screen oriented (HMI) and factory automated (IOT) data collection
- Runs from a Microsoft SQL back-end with Microsoft Windows domain authentication and security
- Seamless, flow-less, bi-directional integration with your ERP using approved APIs
- Can be integrated to third party software: payroll, label printing, QMS, DMS, PMS and others
- Can be deployed as an on premise or cloud hosted solution
- Can be installed and made ready for use quickly
- Lightweight and highly configurable

# Advanced Planning & Scheduling

## 1.1 Resource definition and management

- Primary (machines, employees) and secondary (tools) resource import from ERP
- Shift calendars and custom activities: working, lunch, breaks, maintenance, etc.
- Variable resource availability definition on hourly, daily or weekly basis
- Easy shift maintenance including planned \ unplanned maintenance, bank holidays etc.
- Alternative resource management
- Primary and secondary constraint management

## 1.2 Detailed scheduling

### 1.2.1 Multiple resource scheduling including:

- Machine scheduling
- Labour scheduling
- Tool scheduling
- Maintenance scheduling

### 1.2.2 Customisable loading of scheduling demand

- Production Jobs
- Sub jobs
- MRP jobs
- What-if jobs
- By period, job status, planner or equipment

### 1.2.3 Powerful grids and views for job prioritisation

- Job, sub-job, operation and raw material views
- Data filters, grouping and sorting
- Customisable fields, mappings and naming
- Unlimited job markers and user defined fields
- Data exports to excel

### 1.2.4 Customisable workflows for identification of scheduling demand and priority (e.g. urgent, unscheduled, past due)

### 1.2.5 High resolution calendar-based Gantt graphical planning board

- Detailed visibility from minutes to weeks
- Colour coded shift and time patterns
- Visibility of schedule, resource utilisation and time phased resource consumption
- Visibility of schedule execution

### 1.2.6 Manual and auto scheduling of individual operations, sequenced operations within a job and sequenced jobs within sub job hierarchies

- Parallel operations scheduling
- Scheduling with move and queue times
- Schedule with overlapping operations (quantity and percent)
- Schedule run, start-up, setup, wait and tear-down activities
- Outside process operation scheduling

### 1.2.7 Forward and backward auto scheduling with rule and priority-based scenarios for scheduling optimisation

- Schedule optimisation with field-based grouping
- Schedule optimisation with field-based cascade grouping (i.e. schedule by colour: red, green, blue; then by shape: round, rectangle, stripe.)
- Schedule optimisation with custom priority-based grouping
- Schedule optimisation with group sequencing
- Schedule optimisation with group dependency linkages

### 1.2.8 Drag and drop scheduling with enhanced impact behaviours

- Autofit
- Auto shift with replace and move options
- Schedule around

# Advanced Planning & Scheduling

## 1.2 Detailed scheduling (cont...)

1.2.9 Semi-automatic reschedule of late operations with autofit, shift, replace, move and schedule around options

1.2.10 Fixed jobs and period fencing (pinning)

1.2.11 Alternative resource scheduling with item/operation-based constraints

1.2.12 Variable resource constraint consumption strategies

1.2.13 What If and Capable to Promise (CTP) scenarios for capacity and materials

1.2.14 Dynamic scheduling and execution alerts

- Dynamic visualisation of production progress
- Running late/early visualisation (hours and percent)
- Change tracking by scheduling action
- Schedule early and schedule late visualisation

## 1.3 Material planning and availability analysis

- Dynamic time-phased stock consumption and replenishment calculation
- Dynamic job-based availability with good to go, shortage and partial shortage indicators
- Detailed BOM drilldown with component availability, shortage and partial shortage indicators
- Detailed BOM component time-phased stock movement analysis
- Material availability in What If scenarios
- Material reservation and exclusions
- MRP overview & detailed stock movement analysis (on the fly)

## 1.4 Capacity planning

- MPS capacity charts and reporting
- Overall, weekly or monthly capacity plan
- Capacity plan drill down to regular, MRP and forecast jobs

## 1.5 Publishing and dispatching

- Real-time update of ERP manufacturing data based on a finite capacity based schedule
- Planning dashboard publishing with drillable loading and order fulfillment analysis
- Production schedule Gantt view online publishing with production progress visualisation
- High level and detailed, live and trended, equipment loading analysis
- Online jobs status view
- Materials requirement lists by work centre and machine schedule
- Work centre and machine detailed production plans
- Printable production plan, shop packet and late delivery reports
- Real-time dispatching of production plan to shop floor terminals

# Shop Floor Data Collection & Tracking

0 Introduction

1 Advanced Planning  
& Scheduling

**2 Shop Floor Data Collection  
& Tracking**

3 Factory Digitalisation  
& Automation

4 Factory Performance  
& Loss Management

5 Factory Collaboration  
& Paperless Shop

6 Administration, Security  
& Connectivity

## 2.1 Data acquisition

2.1.1 Employee time and attendance clock in/out (i.e. start/end day)

2.1.2 Real-time data collection from employees, crews, equipment and equipment groups using:

- Touch screen based (HMI) for manual start-stop data collection
- Automatic data collection (IOT) from a digitalised factory
- Combination of automatic (IOT) and manual (HMI) data collection
- Barcode entry

2.1.3 Optional timesheet data entry

2.1.4 Optional custom integration with payroll and/or HR systems

2.1.5 Support of data collection from multiple time zones

## Configurable terminals

2.2.1 Configurable web based human-machine interface (HMI)

2.2.2 Fully customisable functional and graphical terminal behaviours

- Entrance terminals
- Factory terminals for employees and equipment
- Shared and dedicated terminals

2.2.3 Visualisation of live job and operational progress and execution statistics

- Real-time publishing of the production plan to factory terminals
- Live execution statistics by shift at employee and equipment level
- Terminal based OLE and OEE key performance indicators

2.2.4 Data capture and transaction management options

- Customisable process parameters (weight, pressure, etc.)
- Customisable activity classification codes
- Real-time generation or accumulated transaction control

2.2.5 Manual, barcode and RFID terminal access with optional password protection

## 2.3 Job management

2.3.1 Job selection

- Start/end job by an employee, crew or equipment
- Select from jobs list (with option to pre-filter)
- Select from scheduled job list by terminal - machine
- Select from an enforced schedule by terminal - machine
- Select by scanning a barcode

2.3.2 Job transaction

- Operational completion including warehouse/bin/serial/lot control
- Operational and job scrap reporting including scrap reason codes
- Job completion (finished good) including warehouse/bin/serial/lot control
- Tracking of rework related activity

2.3.3 Job labeling

- Label print with Bartender
- Label print with SSRS

# Shop Floor Data Collection & Tracking

0 Introduction

---

1 Advanced Planning  
& Scheduling

---

**2 Shop Floor Data Collection  
& Tracking**

---

3 Factory Digitalisation  
& Automation

---

4 Factory Performance  
& Loss Management

---

5 Factory Collaboration  
& Paperless Shop

---

6 Administration, Security  
& Connectivity

---

## 2.3 Job management (cont...)

### 2.3.3 Production issue management

- Support of Six Big Loss analytics
- Manual issue creation based on custom values
- Semi - automatic issue creation based on slow or fast performance
- Automatic issue creation based on predefined alerts and thresholds

## 2.4 Time management

### 2.4.1 Execution of single and multiple jobs at a time

### 2.4.2 Variable time split scenarios in multi job environments

- Even time split
- Proportional time split
- No time split

### 2.4.3 Crew control (Start/end jobs or downtime for entire crew)

### 2.4.4 Downtime and non-productive time management

- Start/end non-productive and down time (employee, crew, equipment or equipment group)
- Differentiation between non-operational, non-productive, direct and indirect activity
- Unlimited, customisable non-productive codes
- Posting of non-productive time to ERP

### 2.4.5 Scheduled events, i.e. auto break or lunch deduction; end of working shift

## 2.5 Inventory management

### 2.5.1 Material issues including warehouse/bin/serial/lot control

- Single component issues
- Multiple component kit issues
- Backflush based on completed operational quantity and scrap

### 2.5.2 Material reject including reject reason codes

### 2.5.3 Warn or prevent controls for:

- Over/under production
- Over/under material issues
- Completion while open remaining quantity exists
- Serial/lot/bin control
- Scrap/reject reason code enforcement
- Starting an operation while the previous one has not been completed or started

## 2.6 Real-time status tracking

### 2.6.1 Live execution dashboard

- Employee and equipment tracking
- Order management indicators with drill downs
- Production output planned vs actual statistics
- Real-time and trending OLE and OEE metrics

# Shop Floor Data Collection & Tracking

0 Introduction

1 Advanced Planning  
& Scheduling

**2 Shop Floor Data Collection  
& Tracking**

3 Factory Digitalisation  
& Automation

4 Factory Performance  
& Loss Management

5 Factory Collaboration  
& Paperless Shop

6 Administration, Security  
& Connectivity

## 2.6 Real-time status tracking (cont...)

### 2.6.2 Live employee and equipment status

- Card and list views
- Resource photo identification
- Colour-coded productive, non-productive or downtime indication
- Visualisation of overall daily statistics
- Visibility of current jobs and jobs progress
- Visibility of OLE/OEE with supporting metrics
- Live loss visualisation and classification
- Live visualisation of production issues and alerts
- Drill down for detailed information (current activity; progress versus schedule; history of alerts and production issues)

### 2.6.3 Live job status

- List of open jobs with real time execution analysis
- Indication of open production issues related to a job
- Drill down to job card for detailed analysis
- Overall job execution statistics
- Operations execution statistics
- Raw materials consumption
- Production issues related to a job
- File, link and online-form attachments
- Drill downs to sub job hierarchies

## 2.7 Performance management

### 2.7.1 Dashboard with key metrics and statistics

- OLE/OEE: availability, performance and quality
- Loss visualisation and classification

### 2.7.2 Detailed employee and equipment performance analysis

- Summarised execution statistics by day, week or month
- Planned vs actual productive time
- Direct vs indirect downtime
- Good vs bad parts count
- OLE/OEE key performance indicators

### 2.7.3 Alerts and production issues visibility

## 2.8 Supervisory control and administration

### 2.8.1 Management reports for consolidated tracking

- Attendance (payroll) vs activity (transactions) reconciliation and adjustment
- Calendar view of resource availability with productive, non-productive and total time visibility
- Daily activity audit trail
- Custom configurable pivot reporting

### 2.8.2 Transaction control & management

- Edit/delete transactions generated from shop floor terminals
- Create new transactions directly in transactions review
- Approve transactions prior to posting to ERP
- Configurable rules to drive automatic transaction approval
- ERP posting workflow management
- ERP posting reversals with audit trail
- Management of ERP posting errors

### 2.8.3 Quick timesheet data entry for handling multiple employees

0 Introduction

---

1 Advanced Planning  
& Scheduling

---

2 Shop Floor Data Collection  
& Tracking

---

**3 Factory Digitalisation  
& Automation**

---

4 Factory Performance  
& Loss Management

---

5 Factory Collaboration  
& Paperless Shop

---

6 Administration, Security  
& Connectivity

---

# Factory Digitisation & Automation

## 3.1 Industrial connectivity

3.1.2 140+ native drivers to the most common PLC/IO devices including:

- Allen Bradley
- Siemens
- Fanuc
- Honeywell
- Mitsubishi
- Toshiba
- IFM
- GE
- Yokogawa

3.1.3 Support of industrial automation protocols:

- OPC; MTConnect
- Proprietary protocols - GE NIO, SuiteLink, FastDDE
- IT protocols - MQTT, REST, ODBC and SNMP

## 3.2 Automatic data collection from digitised equipment

3.2.1 Equipment state: running, not running, off

3.2.2 Output: good and bad quantities including scrap/reject reason

## 3.3 Semi-automatic data collection from digitised equipment

3.3.1 Combination of machine data (IIoT) and data entered manually via terminals (HMI)

- Job identification and assignment
- Operational quantity
- Operational scrap including reason code
- Equipment downtime with custom classification
- Live assignment of completion and scrap to active running jobs on equipment
- Live equipment tracking, including, status, OEE analysis and loss profile breakdown
- Live equipment alerts and issue logging

## 3.4 Data management

- Live or controlled data posting to ERP/PLM systems
- Data collection from multiple geographical facilities
- Data historian



0 Introduction

1 Advanced Planning  
& Scheduling

2 Shop Floor Data Collection  
& Tracking

3 Factory Digitalisation  
& Automation

**4 Factory Performance  
& Loss Management**

5 Factory Collaboration  
& Paperless Shop

6 Administration, Security  
& Connectivity

# Factory Performance & Loss Management

## 4.1 Factory performance analysis

4.1.1 Live factory dashboards with supporting metrics for Overall Labour Effectiveness (OLE), Overall Equipment Effectiveness (OEE) and Total Effective Equipment Performance (TEEP)

4.1.2 Dedicated equipment loading dashboard with actual, averaged and trended analysis

- Loading loss profile
- Categorised qualitative and quantitative loading metrics
- Detailed analysis by individual equipment

4.1.3 Dedicated employee and equipment availability dashboard with actual, averaged and trended analysis

- Availability loss profile breakdown
- Categorised qualitative and quantitative availability metrics
- Detailed analysis by individual employee or equipment

4.1.4 Dedicated employee and equipment performance dashboard with actual, averaged and trended analysis

- Performance loss profile breakdown
- Categorised qualitative and quantitative performance metrics
- Detailed analysis by individual employee or equipment

4.1.5 Dedicated employee and equipment quality dashboard with actual, averaged and trended analysis

- Quality loss profile breakdown
- Categorised qualitative and quantitative quality metrics
- Detailed analysis by individual employee or equipment

## 4.2 Employee performance analysis

- Overall dashboard with key statistics for actual, averaged and trended OLE analysis
- Detailed OLE analysis by employee
- Detailed OLE analysis by period: daily, weekly and monthly breakdown
- Detailed activity type (diversions) analysis by period: daily, weekly and monthly breakdown
- Detailed calendar view of employee availability with productive, non-productive and total time visibility: daily, weekly and monthly breakdown

## 4.3 Equipment performance analysis

- Overall dashboard with key statistics for actual, averaged and trended OEE analysis
- Detailed OEE analysis by equipment
- Detailed OEE analysis by period: daily, weekly and monthly breakdown
- Detailed activity type (diversions) analysis by period: daily, weekly and monthly breakdown
- Detailed calendar view of equipment availability with productive, non-productive and total time visibility: daily, weekly and monthly breakdown

## 4.4 Product analysis

4.4.1 Actual and trended product performance analysis

- Average product performance by employee and equipment
- Detailed stock code/operation performance analysis with drilldown to daily, weekly or monthly breakdown
- Calculated cycle times by stock code/operation

0 Introduction

---

1 Advanced Planning  
& Scheduling

---

2 Shop Floor Data Collection  
& Tracking

---

3 Factory Digitalisation  
& Automation

---

**4 Factory Performance  
& Loss Management**

---

5 Factory Collaboration  
& Paperless Shop

---

6 Administration, Security  
& Connectivity

---

# Factory Performance & Loss Management

## 4.4 Product analysis (cont...)

### 4.4.2 Actual and trended product quality analysis

- Average product quality by employee and equipment
- Detailed stock code/operation quality analysis with drilldown to daily, weekly or monthly breakdown
- Calculated scrap factor by stock code/operation

## 4.5 Loss visualisation

- Loss management dashboards and visualisation of employees and equipment
- Breakdown and visualisation of plant loss from calendar hours to effective hours
- Loading loss visualisation of planned downtime
- Availability loss visualisation of unplanned downtime
- Performance loss visualisation of reduced speed and minor stoppages
- Quality loss visualisation of production rejects (i.e. scrap reasons)
- Drilldowns to detailed and summarised raw data

0 Introduction

1 Advanced Planning  
& Scheduling

2 Shop Floor Data Collection  
& Tracking

3 Factory Digitalisation  
& Automation

4 Factory Performance  
& Loss Management

**5 Factory Collaboration  
& Paperless Shop**

6 Administration, Security  
& Connectivity

# Factory Collaboration & Paperless Shop

## 5.1 Instant messaging

- Messaging between employee and higher-level management
- Rich text format messaging with optional email message delivery
- In-application or email alert delivery
- Message notifications

## 5.2 Configurable alerts

5.2.1 Automated alert creation and tracking of manufacturing process abnormalities

5.2.2 Multiple process measurement by single resource or organizational groups

- Availability
- Performance
- Quality
- Downtime duration
- Scrap reason

5.2.3 Configurable thresholds

5.2.4 Custom measurement schedules

5.2.5 Automatic designation of alerts based on organisational structures

## 5.3 Issue management

5.3.1 Simple production issue creation and notification

- Automatic creation of production issues based on exceeded tolerances
- Manual creation of production issues requiring further action
- Automatic notification of issues based on organisational structures

5.3.2 Integrated workflow and insight of production issues

- Classification of issues based on Six Big Loss or custom values
- Assignment of issues for corrective and preventative action
- Tracking of corrective and preventative action activity
- Resolution of corrective and preventative action for historical analysis

## 5.4 Paperless shop

5.4.1 Easy access to static files, simple forms supporting online:

- Assembly instructions
- CAD drawings
- Basic data capture with simple forms
- Quality control checks
- Instructional videos
- Other

5.4.2 Link to document management systems for versioning and audit trails

5.4.3 Associate with multiple record types including:

- Job
- Operation
- Employee
- Equipment
- Item

5.4.4 Document library for centralised maintenance

# Administration, Security & Connectivity

## 6.1 Administration and accessibility

- Unlimited APS desktop client installs for environment with multiple production planners
- Secure, web-based, configurable SFDC terminals for operators and team leads
- Any device-anywhere access of factory schedules, alerts, messages, documentation and performance analysis
- Separate IT and factory administration settings for simple and secure user, resource, terminal and alert maintenance

## 6.2 Information sharing and security

- Integration with Microsoft Active Directory for single sign on
- Multi factor authentication for workbench employees (e.g. pincode entry required)
- Information access control by organisational group (vertical and horizontal)
- Role-based control for data security, ownership and responsibility
- Easy to understand dashboards with powerful drill downs
- Real time manufacturing process visibility across the organisation
- Online production plan publishing with plan enforcement options

## 6.3 In-app integration

### 6.3.1 Easy to configure webhooks for linking to external applications for

- Electronic 'attachment free' shop travellers, work instructions and custom form information
- Label printing services and printers
- Custom web-based reporting (SSRS, Crystal reports, other)
- External document management systems
- Video instructions and tutorials
- Quality management systems

## 6.4 Application extensions

### 6.4.1 Optional custom integration to resource management software (e.g. Payroll, Time & Attendance) for example:

- ADP
- Equator
- Mitrefinch
- Paycor
- Tensor

### 6.4.3 Optional custom integration to quality management software (QMS, SPC, SQC, CAQ) for example:

- iGrafx
- Minitab
- Qpulse
- Unipoint

### 6.4.4 Optional custom integration to inventory management software providers (e.g. Label Printing, WMS, Demand Management) for example:

- Bartender Label
- Domino Label
- Datascope WMS

### 6.4.5 Optional custom integration to preventative maintenance software providers (CMMS, PAMS) for example:

- Fiix
- PEMAC

### 6.4.6 Optional custom integration to product lifecycle management software providers (PLM) for example:

- Autodesk Fusion 360
- Solidworks

# LYNQ

AMER | EMEA | APAC