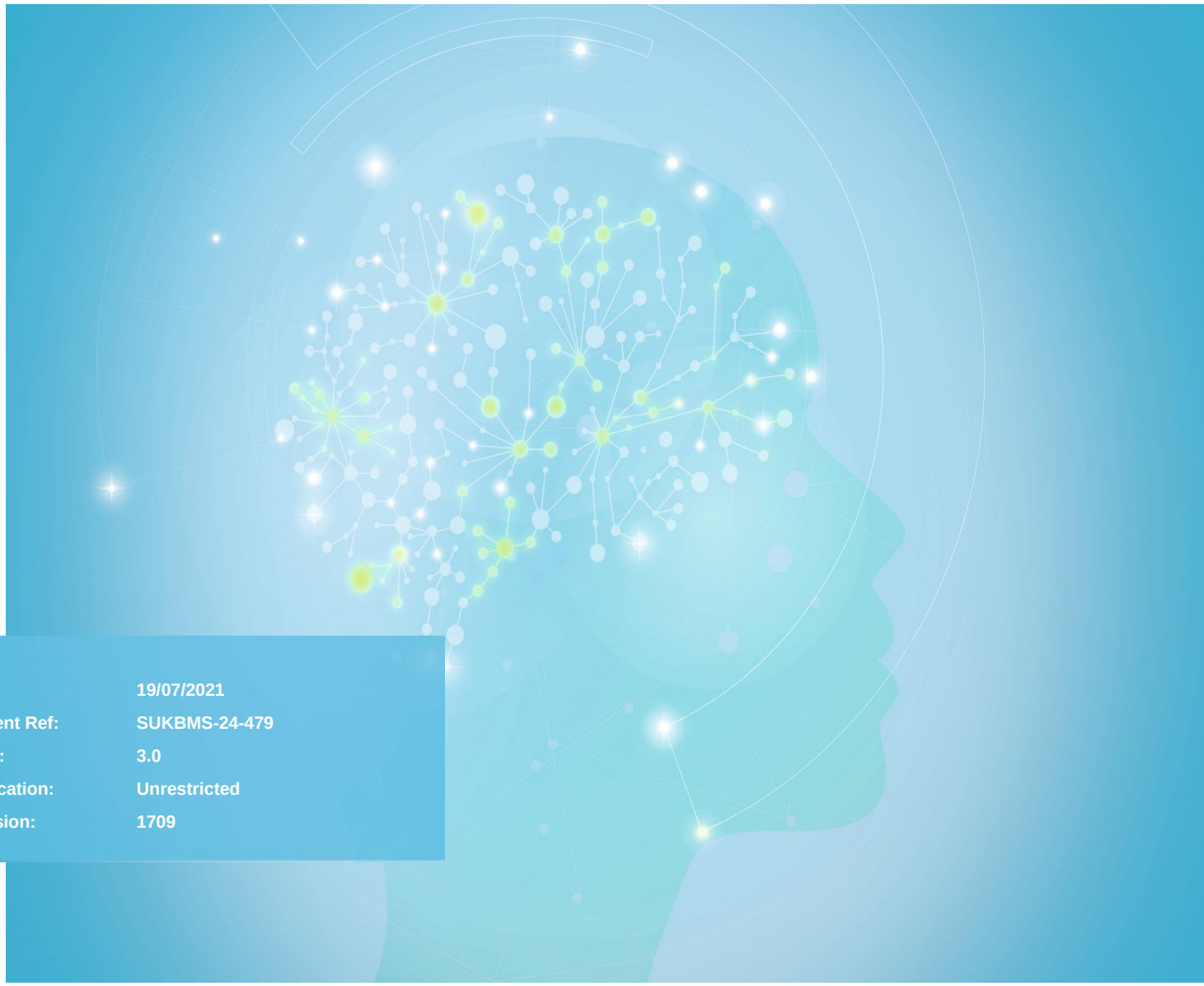
Routine Use Training Workbook

XN-Series Track (CT-90)



Date:	**19/07/2021**
Document Ref:	**SUKBMS-24-479**
Version:	**3.0**
Classification:	**Unrestricted**
IFU version:	**1709**

Sysmex House, Garamonde Drive, Wymbush, Milton Keynes, MK8 8DF, United Kingdom · Phone +44 333 320 3460 · Fax +44 1908 267 901
academy.training@sysmex.co.uk · **www.sysmex.co.uk**

Contents

Disclaimer

Please note, the information contained in training resources provided by Sysmex should not be used as an alternative to your sites Standard Operating Procedure (SOP)/Contract. If you have any particular questions regarding any site specific use of reagents, consumables and/or equipment please contact your Management Team.

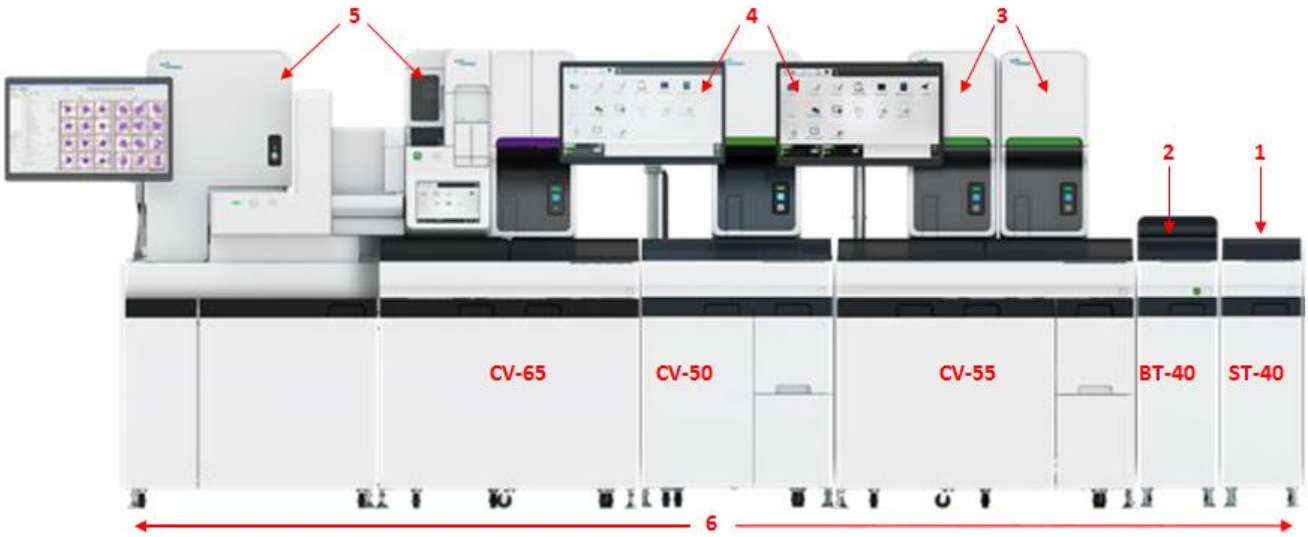
Revision History

Revised Section	Alteration	Name	Date
All	New document to replace the following documents: • XN-9000 Onsite Training Workbook • XN-9100 Onsite Training Workbook	J Hammersley	June 2020
All sections	New document	J Hammersley	June 2020
All sections	XN-Track changed to XN-Series Track	N Bowen	April 2021
Contact Us	Removal of 'Online'	N Bowen	July 2021

Reference Documents

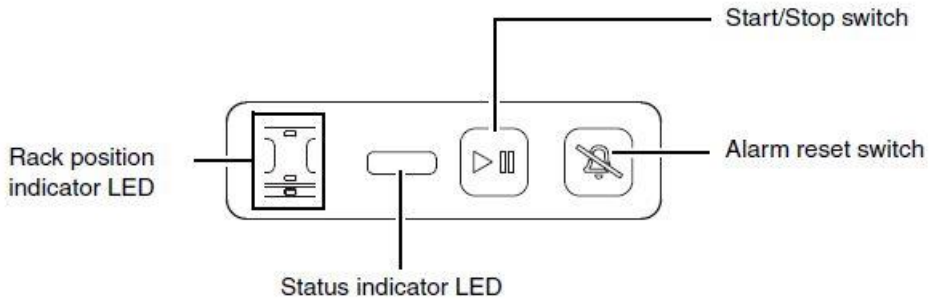
Document title	Version	Date
XN-9x000 Information for User	1709	August 2019

XN-Series Track Components



1. **Start Yard (ST-40)** – A Maximum of 25 racks can be loaded here. From here racks are fed into the next device to the left. Each ST-40 unit has its own control panel.

    a. **ST-40 unit control panel**



Status Indicator LED	Description
[Green]	Ready (Analysis or maintenance possible)
Flashing [Green]	Starting up/Analysis in progress/Maintenance in progress
[Orange]	Sample analysis stopped/not possible
Flashing [Red]	Error with audible alarm
[Red]	Audible alarm reset but error still present
[Not lit]	Unit powered off

2. **Barcode Terminal (BT-40)** – This is the sample barcode section where the rack and sample barcodes are read. The BT-40 has the same control panel as the ST-40 unit.

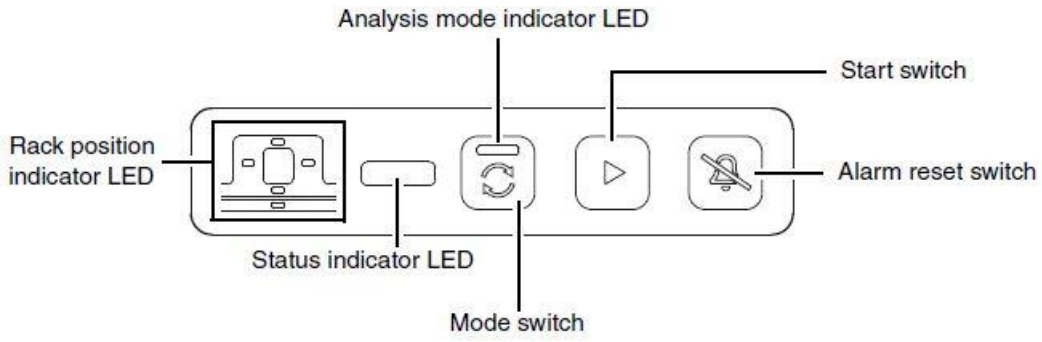
3. **XN-analysers** – XN analysers are responsible for processing full blood count samples. The XN analysers are placed on conveyor (CV) units depending on whether they are single or double configurations, known as CV-50 and CV-55 respectively.

4. **Information Processing Unit (IPU)** - Runs the operating software for the XN-Series analyser and is the user interface for the analyser. A single IPU can be connected to up to 3 XN units. The IPU holds up to 100,000 complete sample records in its database. All settings, calibration files and flagging limits are also stored on the IPU.

5. **Connectable Analysers** – Additional connectable analysers including the SP-Series, DI-60, TS-Series, Starrsed analysers and TOSOH Series analysers.

6. **XN-Series Track** – Each analyser is placed on its own individual conveyor (CV-50/55/65), which provides storage for reagents, consumable or PC desktops. Each conveyor unit has its own individual control panel and power button.

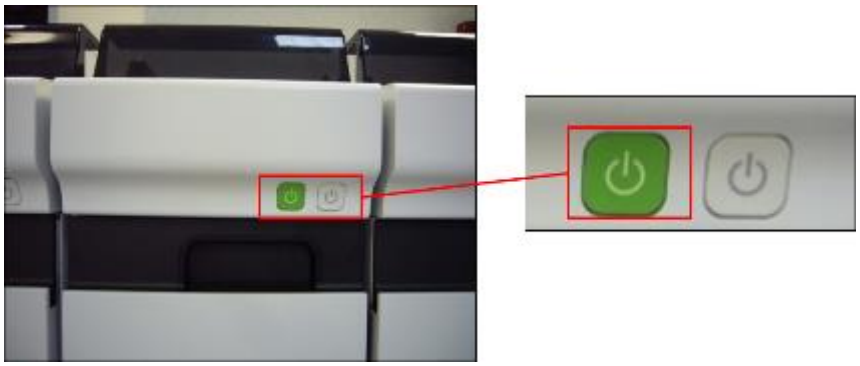
   a. **CV-50/CV-55/CV-65 unit control panel**



Status Indicator LED	Description
[Green]	Ready (Analysis or maintenance possible)
Flashing [Green]	Starting up/Analysis in progress/Maintenance in progress
[Orange]	Sample analysis stopped/not possible
Flashing [Red]	Error with audible alarm
[Red]	Audible alarm reset but error still present
[Not lit]	Unit powered off

Analysis Mode Indicator LED	Description
[Green]	Unit in system mode and receiveing sample racks from the right
[Orange]	Unit in offline mode. Unit will not receive sample racks from the right of the XN-Series Track. Sample racks will need to be loaded into the rack recognition area on the right of the analyser.
[Not lit]	Unit powered off

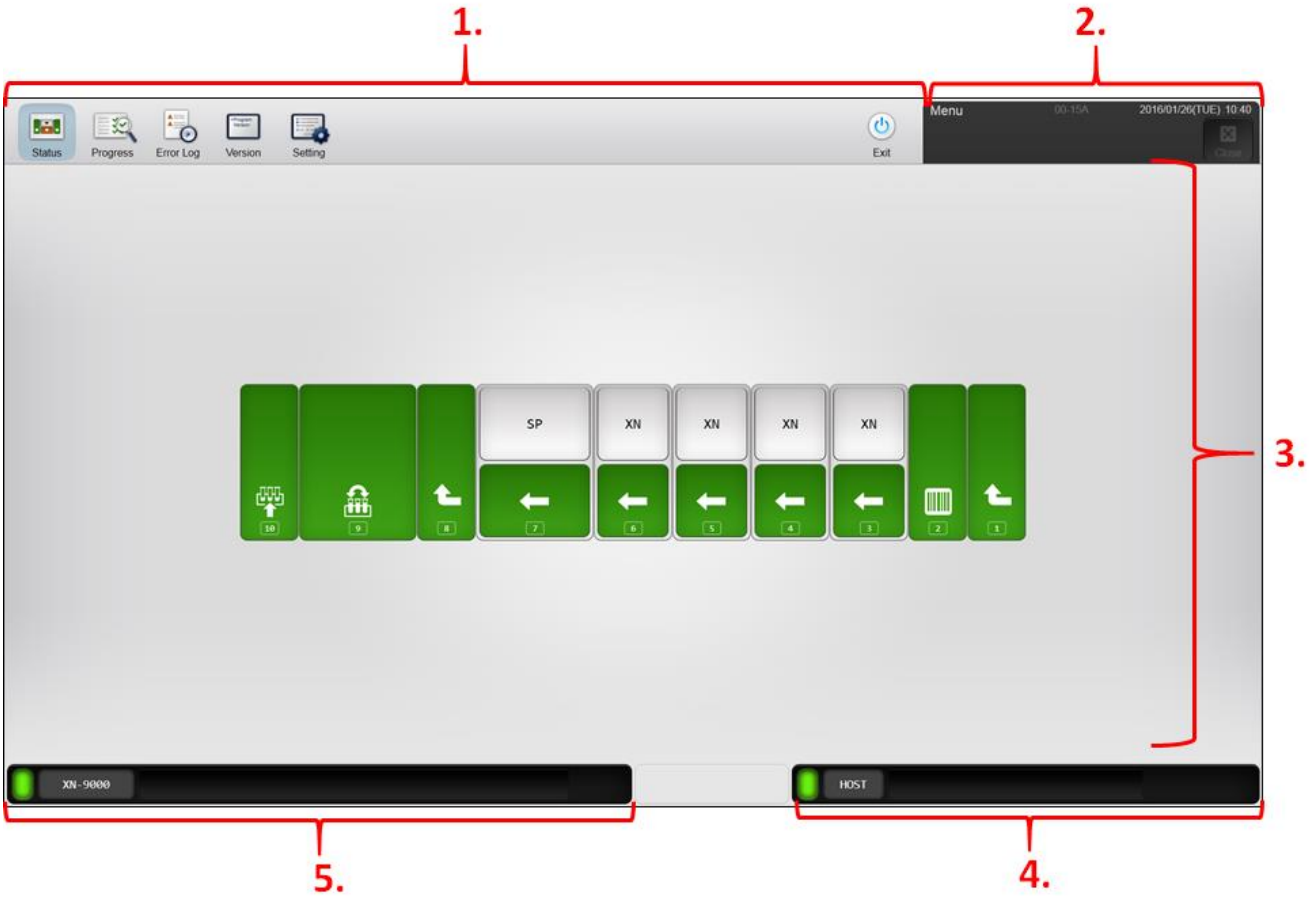
7. **BT-40 Green button** – Used to perform full track shutdown.



8. **CT-90 (Not Shown)** – The CT-90 (Transportation Controller) is responsible for managing order information and controls sample rack transportation. The location of the CT-90 software and desktop will be dependent on the configuration of the analyser. In older XN-9x00 systems the CT-90 software is located on an IPU screen. On newer configurations the CT-90 has a separate screen located above BT-40 unit.

CT-90 (Transportation Controller) Software

Menu Layout



1. **Toolbar (Fixed)** – The fixed toolbar contains;

Status (System Monitor)	Checks the status of the system
Error Log	Displays the error log
Version	Displays the version information of each device
Settings	Used to configure the transportation controller
Exit	Shuts down CT-90

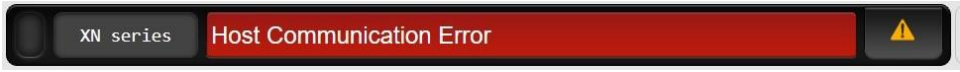
2. **Toolbar (Changeable)** – This toolbar display changes according to the menu option selected in the fixed toolbar.

3. **Main Screen** - The default display is the status screen. This is the area where various processes can be performed.

4. **Host Computer Area** – Displays the host connection with a status indicator light. If a host communication error occurs a warning triangle will also be displayed.

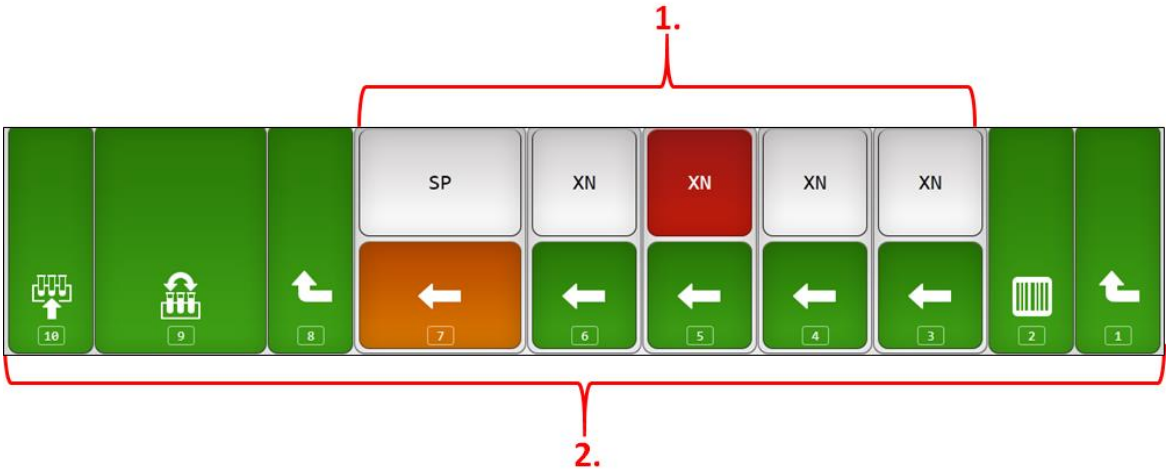
[Not Lit]	Host disconnected
[Green]	Host connected
[Red]	Host connection error

5. **Transportation System Area** – Displays error and warning messages for the entire transportation system if they occur. The status of the transportation system is indicated by a status light. Further information about the error that has occurred can be found by selecting the warning triangle or by viewing the error log.



[Not Lit]	Transportation system powered off
[Green]	Ready
[Red]	Transporation system error

Status Screen



1. **Analyser Information** – Displays the analysers that are connected to the transportation system. The analyser display colour will change according to its status.

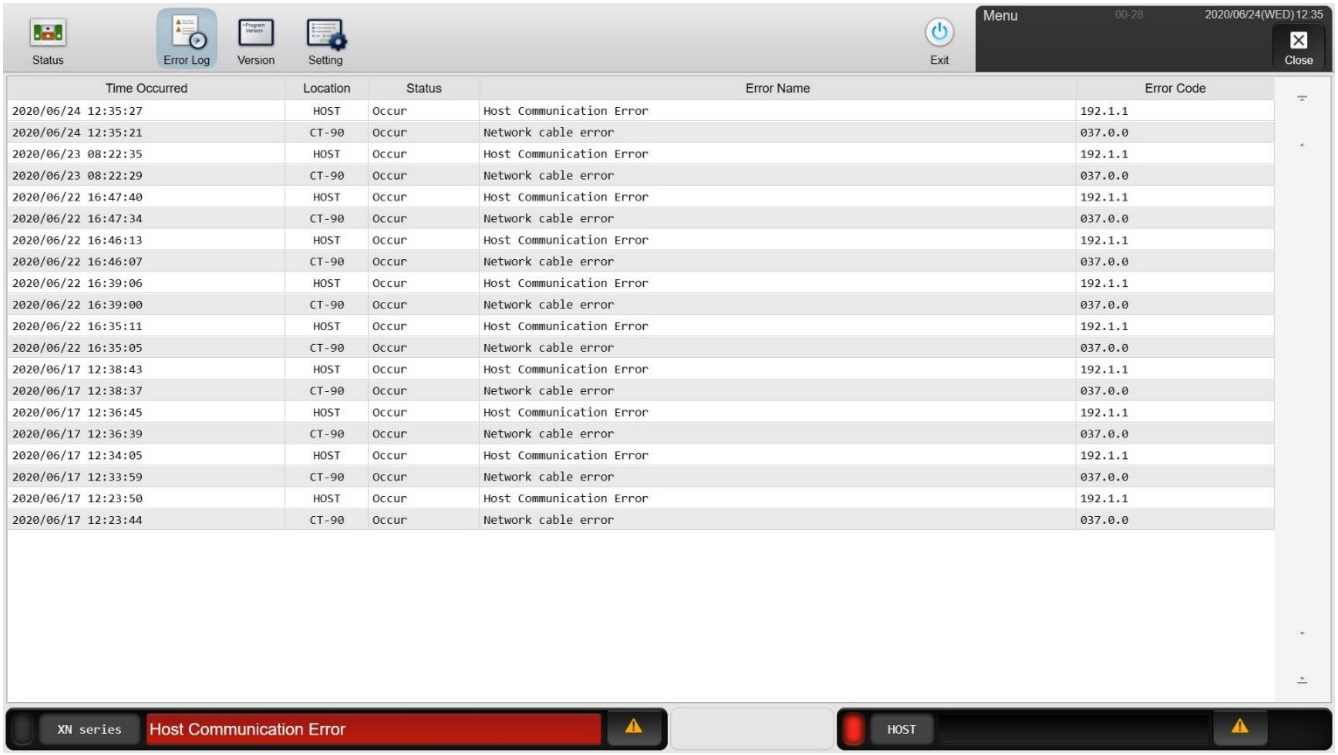
[Grey]	Not connected
[White]	Connected
[Orange]	Starting/maintenance/manual analysis
[Red]	Error/manual tube holder ejected

2. **XN-Series Track Conveyor Units** – Displays the conveyor unit number and status. Unit numbers are assigned in order starting from the right side of the XN-Series Track. These unit numbers are used to distinguish the analysers and track components when checking the progress of samples etc.

[Grey]	Not connected/Powered off
[Green]	Online/Connected
[Orange]	Offline
[Red]	Error

Error Log

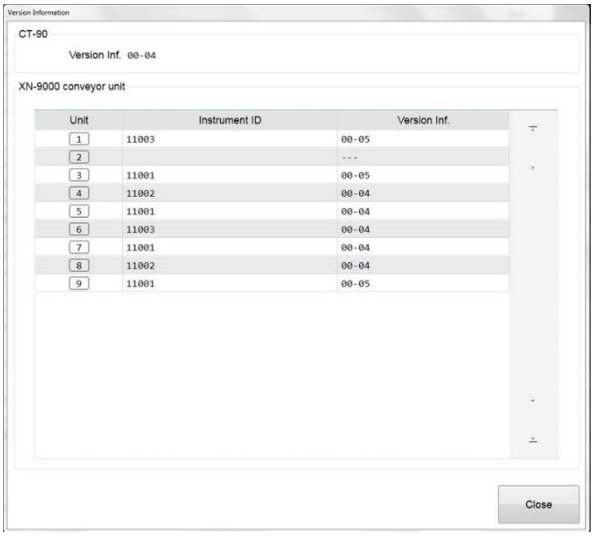
The error log can be used to view further information in relation to transportation or host errors or warnings including the date, time location and error name.



Time Occurred	Location	Status	Error Name	Error Code
2020/06/24 12:35:27	HOST	Occur	Host Communication Error	192.1.1
2020/06/24 12:35:21	CT-90	Occur	Network cable error	037.0.0
2020/06/23 08:22:35	HOST	Occur	Host Communication Error	192.1.1
2020/06/23 08:22:29	CT-90	Occur	Network cable error	037.0.0
2020/06/22 16:47:40	HOST	Occur	Host Communication Error	192.1.1
2020/06/22 16:47:34	CT-90	Occur	Network cable error	037.0.0
2020/06/22 16:46:13	HOST	Occur	Host Communication Error	192.1.1
2020/06/22 16:46:07	CT-90	Occur	Network cable error	037.0.0
2020/06/22 16:39:06	HOST	Occur	Host Communication Error	192.1.1
2020/06/22 16:39:00	CT-90	Occur	Network cable error	037.0.0
2020/06/22 16:35:11	HOST	Occur	Host Communication Error	192.1.1
2020/06/22 16:35:05	CT-90	Occur	Network cable error	037.0.0
2020/06/17 12:38:43	HOST	Occur	Host Communication Error	192.1.1
2020/06/17 12:38:37	CT-90	Occur	Network cable error	037.0.0
2020/06/17 12:36:45	HOST	Occur	Host Communication Error	192.1.1
2020/06/17 12:36:39	CT-90	Occur	Network cable error	037.0.0
2020/06/17 12:34:05	HOST	Occur	Host Communication Error	192.1.1
2020/06/17 12:33:59	CT-90	Occur	Network cable error	037.0.0
2020/06/17 12:23:50	HOST	Occur	Host Communication Error	192.1.1
2020/06/17 12:23:44	CT-90	Occur	Network cable error	037.0.0

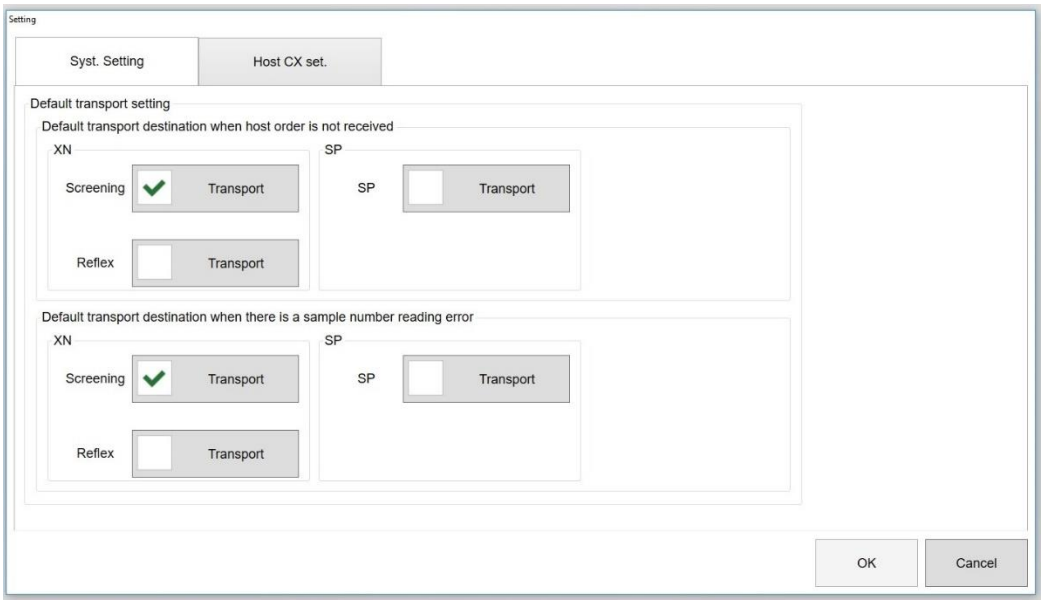
Version

The verison screen shows the serial number and version information for each individual section of the XN-Series track.



Setting Screen

The setting icon allows access to system settings and host connection settings through the appropriate tabs.



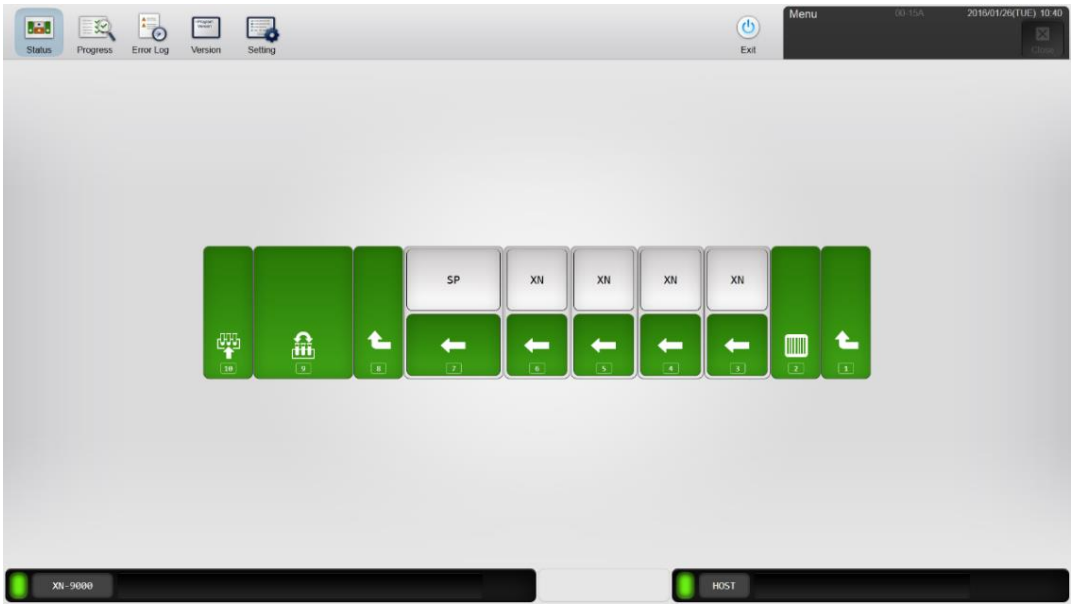
Quick Guides to Using XN-Series Track

As Required Maintenance

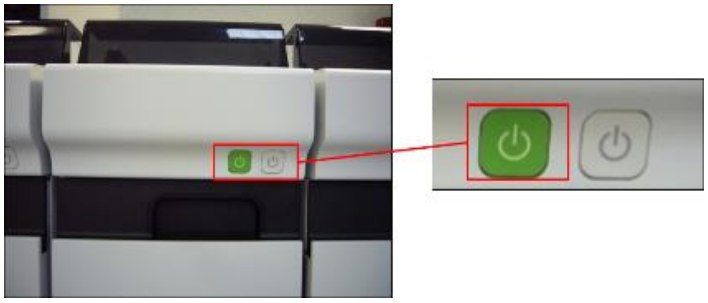
Full Track Shutdown/Start-up

During a full track shutdown the analysers attached to the track do NOT need to be turned off. On the XN-Series the manual tube holder will open on all XN analysers when the CT-90 shuts down allowing urgent samples to be analysed if required. To perform a full XN-Series Track shutdown;

1. Ensure there are no samples being processed on the track
2. Ensure that all status indicators on the track are green



3. Press and hold the green power button located on the front of the BT-40 until you hear a beep. XN analyser tube holders will pop out and if there is a tube sorter (TS) attached the analyser will automatically power off and the draws will automatically open.



4. The CT-90 software will automatically turn off. **IMPORTANT:** Before initiating track startup ensure that the CT-90 PC has fully shutdown.

5. Once CT-90 software has completely shutdown, a track start up can be initiated by pressing (NOT HOLD) the green power button on the front of the BT-40. The status indicator LED light on the BT-40 will light green followed by each individual conveyor unit status indicator LED light, in the order they are numbered on the status screen on the CT-90 software.

6. The CT-90 software will automatically startup and if connected the tube sorter (TS) will automatically start up.

7. Once CT-90 software has successfully started up, close manual tube holders on the XN-analysers. If a tube sorter is present, close tube sorter drawers.

Individual XN-Series Track Unit Power Off

An individual track unit may need to be powered off if a rack gets jammed on the CV-unit. Powering off the relevent XN-Series Track unit will deactivate the rack shift mechanism and allow racks to be removed without damaging the track. To power off an individual XN-Series Track unit;

1. Ensure there are no sample racks currently running through the XN-Series Track unit.

2. Press and hold in the grey power button located on the front of the desired unit until you hear a bleep.

3. The unit will power off. If a rack has become jammed remove the rack if required.

4. Before restarting the desired XN-Series Track unit ensure all racks have been removed. Once all racks have been removed press (DO NOT hold) the grey power button on the front of the desired unit.

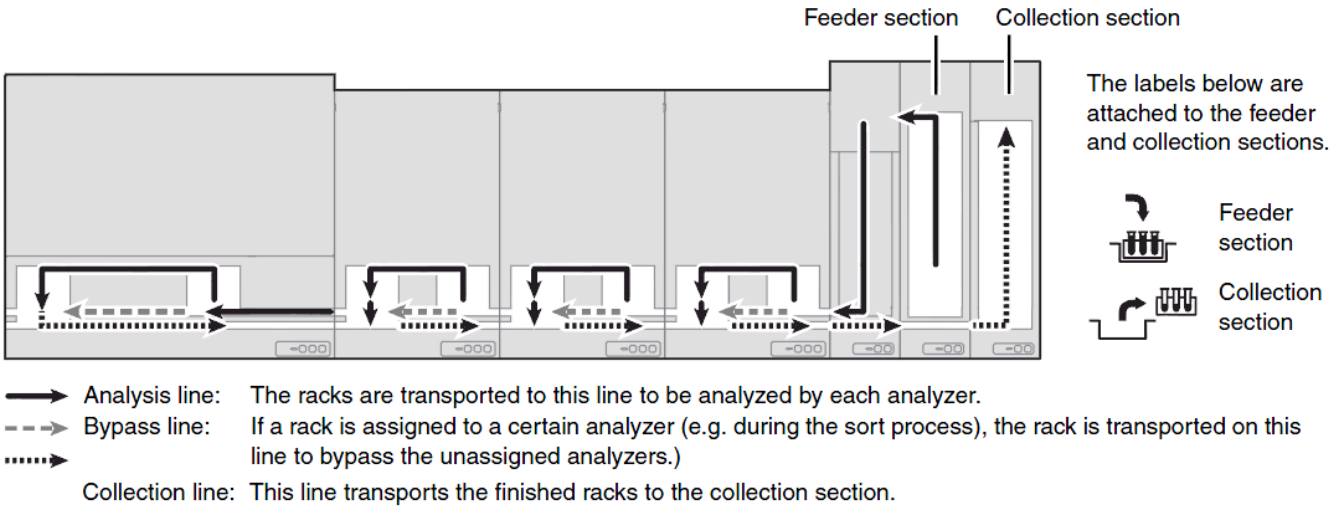
Processing XN CHECK

IMPORTANT: Before processing XN CHECK ensure that the material has been prepared according to instructions.

Processing XN CHECK in System Mode

XN CHECK can be processed through all XN analysers at the same time. To process XN CHECK in system mode;

1. Ensure XN CHECK is correctly prepared before processing.
2. Place XN CHECK requiring processing in the QC rack and load on to the start yard (ST-40). When the BT-40 reads the QC rack barcode the CT-90 will know to send the QC rack to each of the XN analysers in turn.



3. Once XN CHECK has been processed the results should be checked and acted upon according to laboratory guidelines.

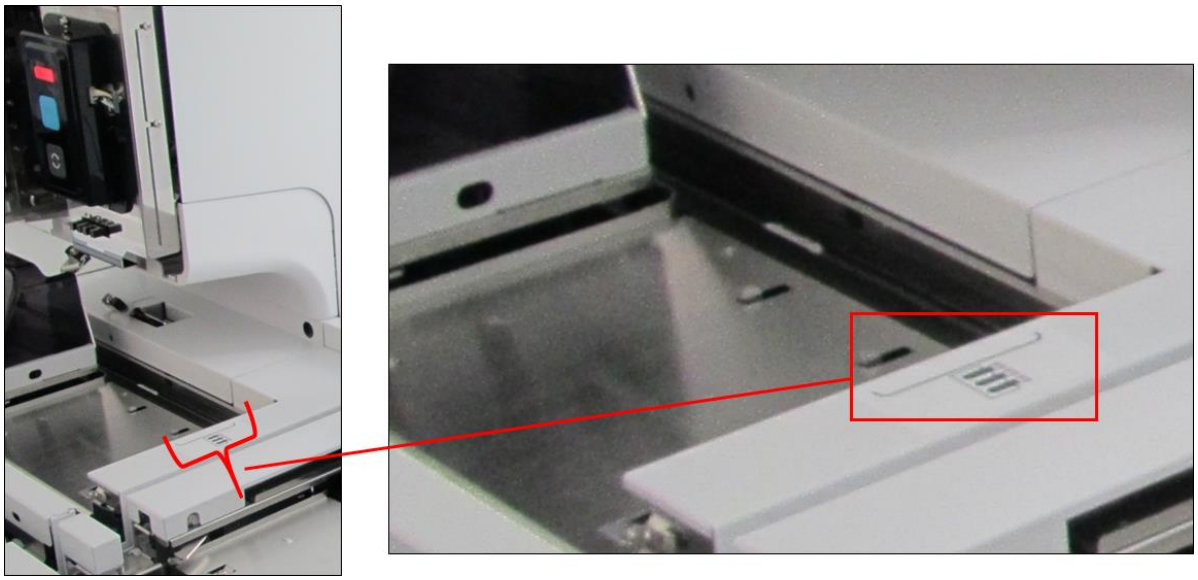
Processing XN CHECK in Offline (Sampler) Mode

QC material can be processed in offline (sampler) mode through an individual XN analyser attached to a CV-50, or dual unit (2 XN analysers) attached to a CV-55, by placing the analyser offline. To process XN CHECK in offline (sampler) mode;

1. Ensure XN CHECK is correctly prepared before processing.

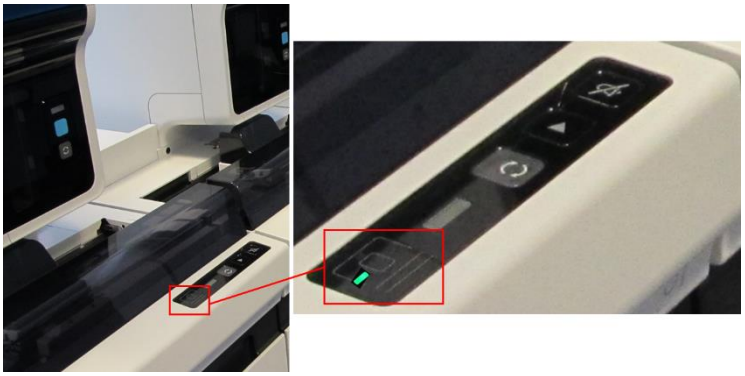
2. Isolate the desired analyser(s) by placing the CV-unit offline using the [Mode Switch] on the CV-unit control panel. Once isolated the analysis mode indicator LED light will change from green to orange.

3. Place the XN CHECK into the appropriate rack and place to the right of the sampler unit in the rack recognition area.



4. All XN CHECK placed in the rack will be processed through all analysers on the CV unit.

5. Once processing is complete the rack will move forward on the left hand side of the CV-unit and the rack position LED will light on the CV-unit control panel. **IMPORTANT:** do not remove the rack until the rack has moved forward and the LED indicator light on the CV unit illuminates green the correct position.



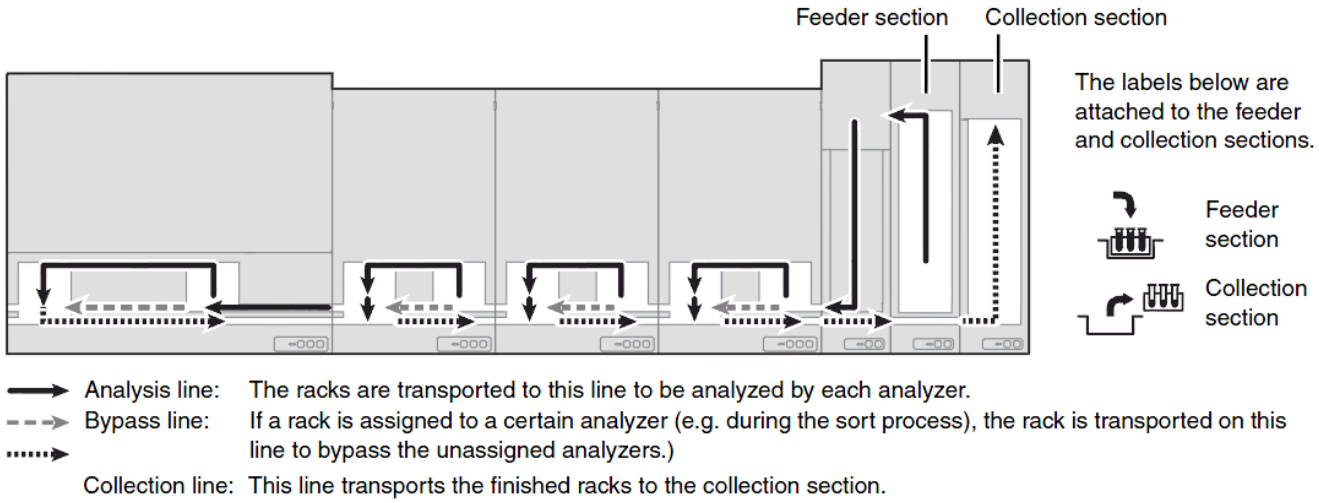
6. Once XN CHECK has been processed the results should be checked and acted upon according to laboratory guidelines.

7. When appropriate the CV-unit can be placed back into system mode by selecting the [Mode Switch] on the appropriate CV-unit control panel. Once in system mode indicator LED light will change from orange to green.

Running Patient Samples

System Mode Analysis

In system mode analysis the operator loads the sample tubes into a rack which is then loaded into the start yard (ST-40) and automatically transported along the XN-Series Track to the most appropriate analyser. This process is controlled by the CT-90 software. The location of the start yard (ST-40) and collection sections can vary depending on XN-9x00 configuration. A typical example is shown below:



To run samples in system mode:

1. Load samples into a sample rack. **IMPORTANT:** Please ensure that samples are mixed sufficiently before being placed on the analyser. Any delay in processing after mixing may lead to the production of incorrect results. This is especially important for samples from patients prone to high degrees of sedimentation or for samples that have been refrigerated/transported in a cool environment.

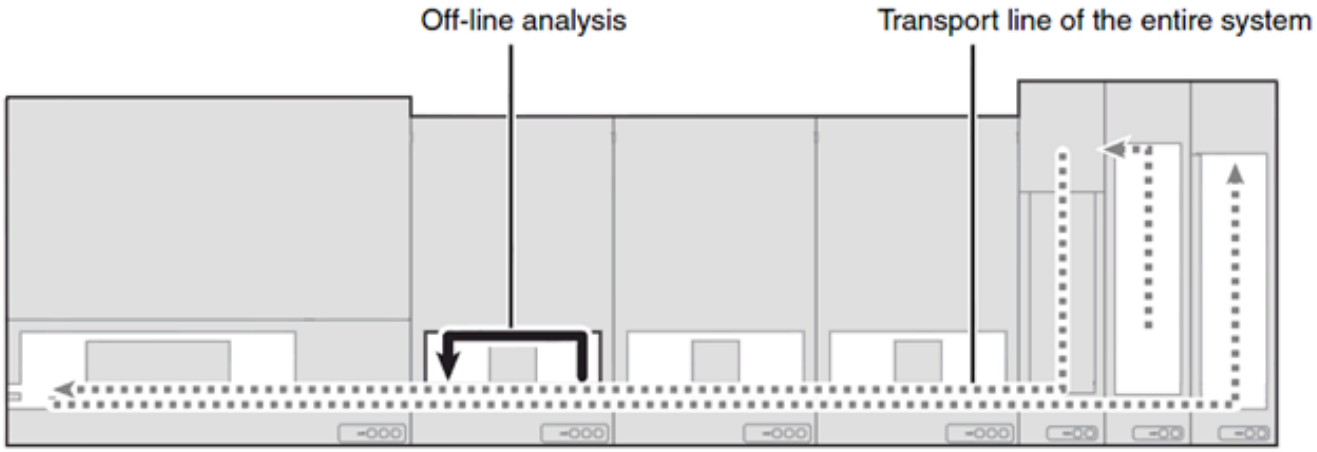
2. The samples will be transported to the barcode terminal (BT-40). The BT-40 will read the sample and the host computer system will be interrogated via the CT-90 to determine the analysis order for each sample. The CT-90 will then determine which CV unit/analyser the rack is sent to based on the analysis orders of the samples in the rack and workload of the system.

3. Once at the analyser a second barcode read is performed and if the barcode is successfully match with that read at the BT-40 the sample is processed. If there is a barcode mismatch the analyser will alarm with a positive ID check error. **IMPORTANT:** when running samples in system mode samples can not be removed or added into a rack until the rack has reached the stock yard (ST-40) due to the presence of multiple barcode reads on the system

4. Following sample analysis the completed racks will be pooled in the stock yard (ST-40) where they can be removed or left to enter the tube sorter (TS-Series) if present.

Offline (Sampler) Mode Analysis

In this mode of analysis the XN analyser(s) are taken offline allowing racks to be loaded on the right handside off the CV-unit. Racks are then automatically transported and analysed by the instrument(s). If a dual XN unit is taken offline the samples will be processed between the two analysers. The rest of the XN-9x00 will continue to run in system mode 'ignoring' the offline analyser.

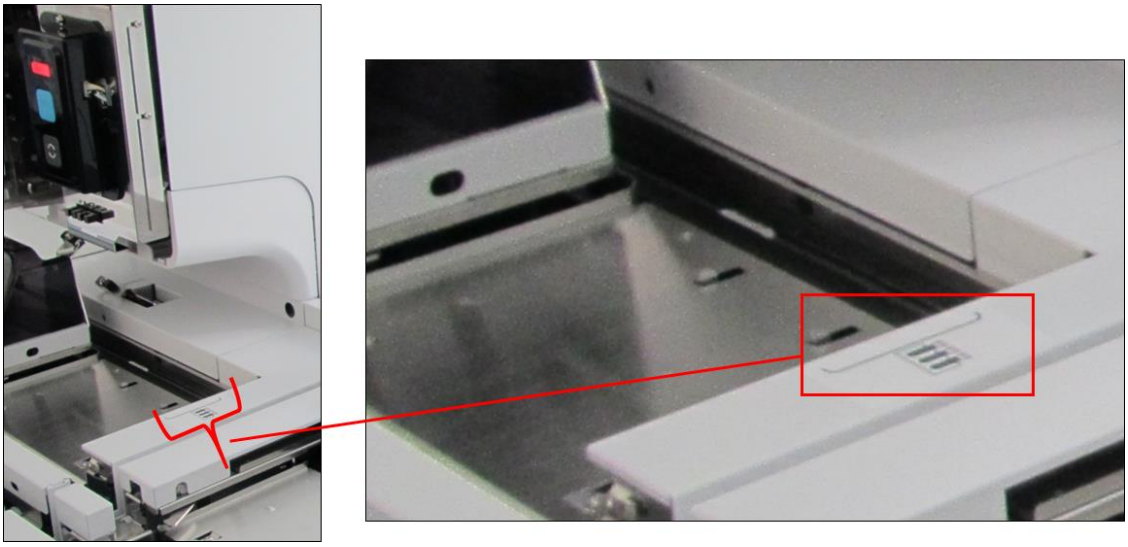


e.g. Transport line when off-line analysis (sampler analysis) is performed on CV-55.

To run samples in offline mode;

1. Isolate the desired XN analyser(s) by selecting the [Mode Switch] on the appropriate CV-unit control panel. Once isolated the analysis mode indicator LED light will change from green to orange.

2. Load samples into a sample rack and place to the right of the sampler unit in the rack recognition area. **IMPORTANT:** Please ensure that samples are mixed sufficiently before being placed on the analyser. Any delay in processing after mixing may lead to the production of incorrect results. This is especially important for samples from patients prone to high degrees of sedimentation or for samples that have been refrigerated/transported in a cool environment.



3. All samples placed in the rack will be processed through all analysers on the CV unit.

4. Once processing is complete the rack will move forward on the left hand side of the CV-unit and the rack position LED will ight on the CV-unit control panel. **IMPORTANT:** do not remove the rack unit the rack has moved forward and the LED indicator light on the CV-unit illuminates green the correct position.

5. Once processing of all samples in sampler mode is complete the CV-unit can be placed back into system mode by selecting the [Mode Switch] on the appropriate CV-unit control panel. Once in system mode indicator LED light will change from orange to green.

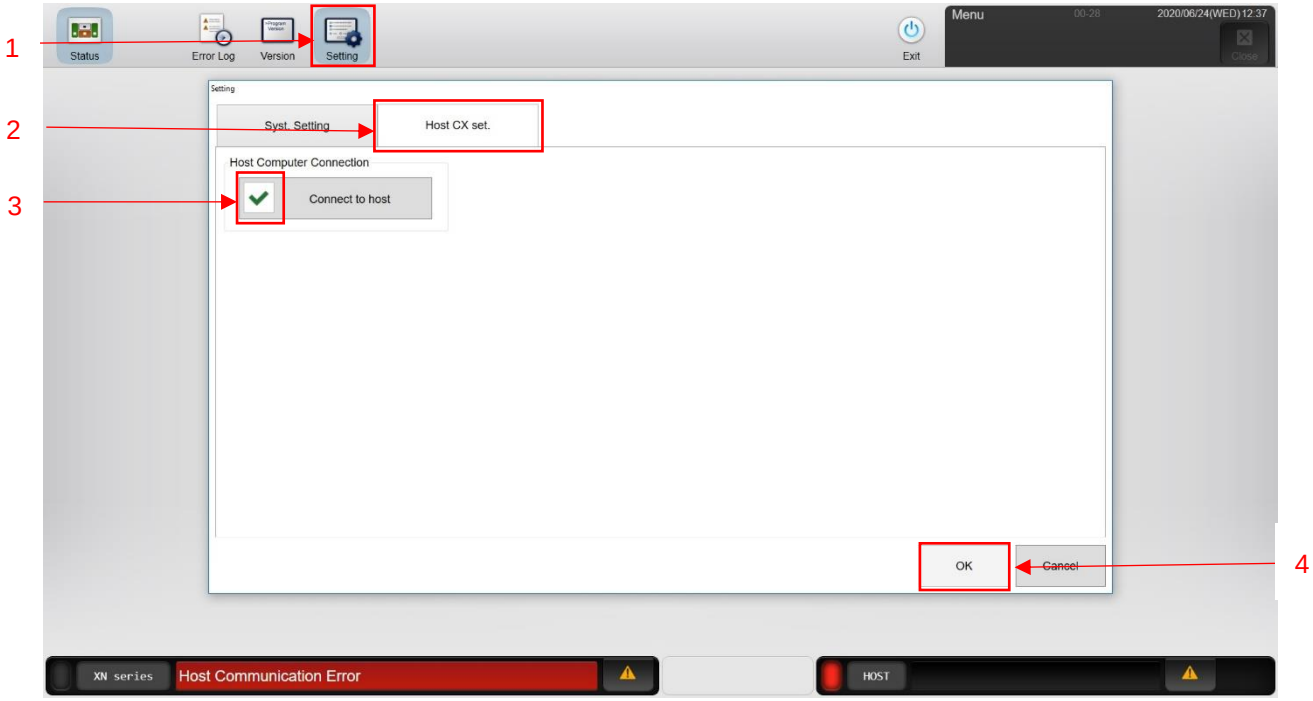
Checking the CT-90 Host Connection

The analyser should always have host communication switched on. This enables the CT-90 to host query for required tests when presented with a sample barcode.

[Green]	Connected
[Red]	Error
[Not lit]	Disconnected

To turn host communication ON:

1. Select [SETTING]
2. Select [Host CX Set]
3. Tick [Connected to host]
4. Select [OK]



To turn Host Communication OFF:

1. Select [SETTING]
2. Select [Host CX Set]
3. Untick [Connected to host]
4. Select [OK]

Dealing with Errors

Errors on the XN-Series Track (CT-90) will result in an audible alarm and flashing red ‘status indicator LED’ on the conveyor unit where the error has occured.

CV-Unit Error

To deal with CV-unit error;

1. Locate the section of track where the error has occurred. **NOTE:** If no section of track has a flashing red ‘status indicator LED’ then check the CT-90 screen for a host communication error.
2. Silence the alarm by using the ‘alarm’ reset button.
3. On the CT-90 screen press the warning triangle in the ‘transportation system error’. This will provide further information on the error that has occurred and the action steps required.
4. Follow the instructions as directed in the error message. **IMPORTANT**: if the error has been caused by a jammed rack, powering off the relevent CV-unit will deactivate the rack shift mechanism and allow racks to be removed without damaging the track.

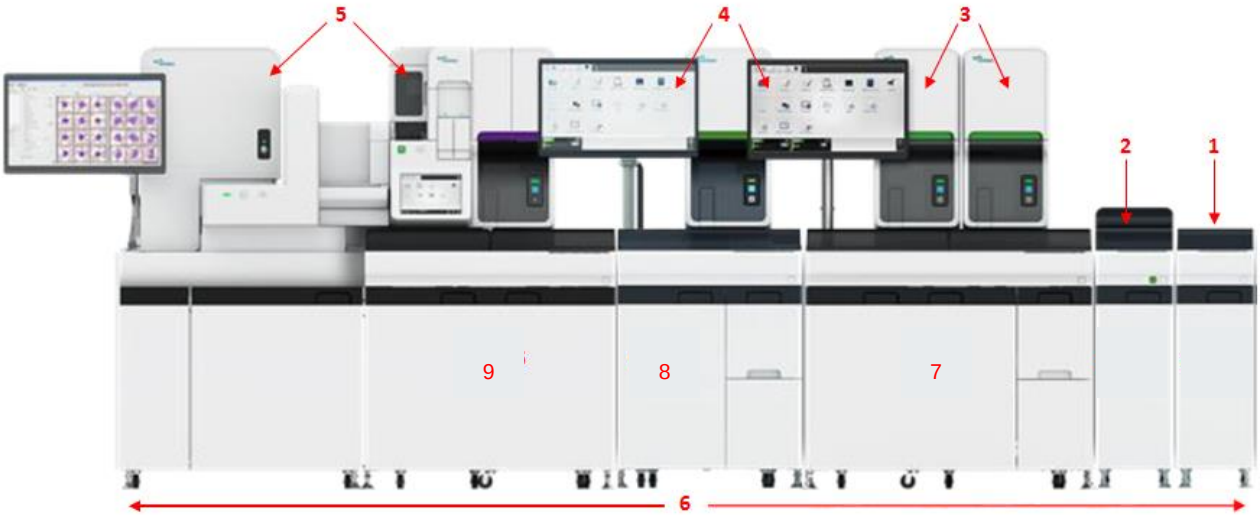
Host connection Error

Host error messages will be displayed in the transportation system area along with a red status light and warning triangle in the ‘host communication area’.

1. Stop further loading of racks on to the XN-Series track.
2. On the CT-90 screen press warning triangle. This will provide further information on the error that has occurred and the action steps required.

Task 1: XN-Series Analyser Components

1. From the list below, label the external parts of the XN-9x00 with it's corresponding number



XN-Series Analysers	Information Processing Unit (IPU)	CV-55
ST-40	Accessory Analyser	BT-40
CV-65	CV-50	XN-Series Track

2. On the status screen what do the colours below indicate;

Component	Colour	Status
Analyser	Grey	
	White	
	Red	
	Orange	
CV-unit	Grey	
	Green	
	Orange	
	Red	

3. Where would you go to connect/disconnect the host communication?

4. Perform a full track shutdown.

5. Why would an individual CV-unit need to be turned off?

Trainee _____ Date _____

Trainer _____ Date _____

Contact Us

Mail

Training Academy
Sysmex UK Ltd
Garamonde Drive
Wymbush
Milton Keynes
MK8 8DF

Phone

Product Hotline For urgent application support	0333 320 3466 (UK)
Service Hotline For technical support and service team	0333 320 3467 (UK)
Reagent ordering	0333 320 3470 (UK)

Email

Product mail (non-urgent)	productmail@sysmex.co.uk
Training Academy (non-urgent)	academy.training@sysmex.co.uk
Jennifer Hammersley	hammersley.jennifer@sysmex.co.uk
Karl Elgerton	elgerton.karl@sysmex.co.uk
Natalie Bowen	bowen.natalie@sysmex.co.uk

Sysmex Academy

https://uk.sysmex-academy.com/

SCAN ME