



VPG+ & SQnet+ presentation



SCS Concept, 20 February 2020

Edition 1



Quality and Production SCS Software Solutions



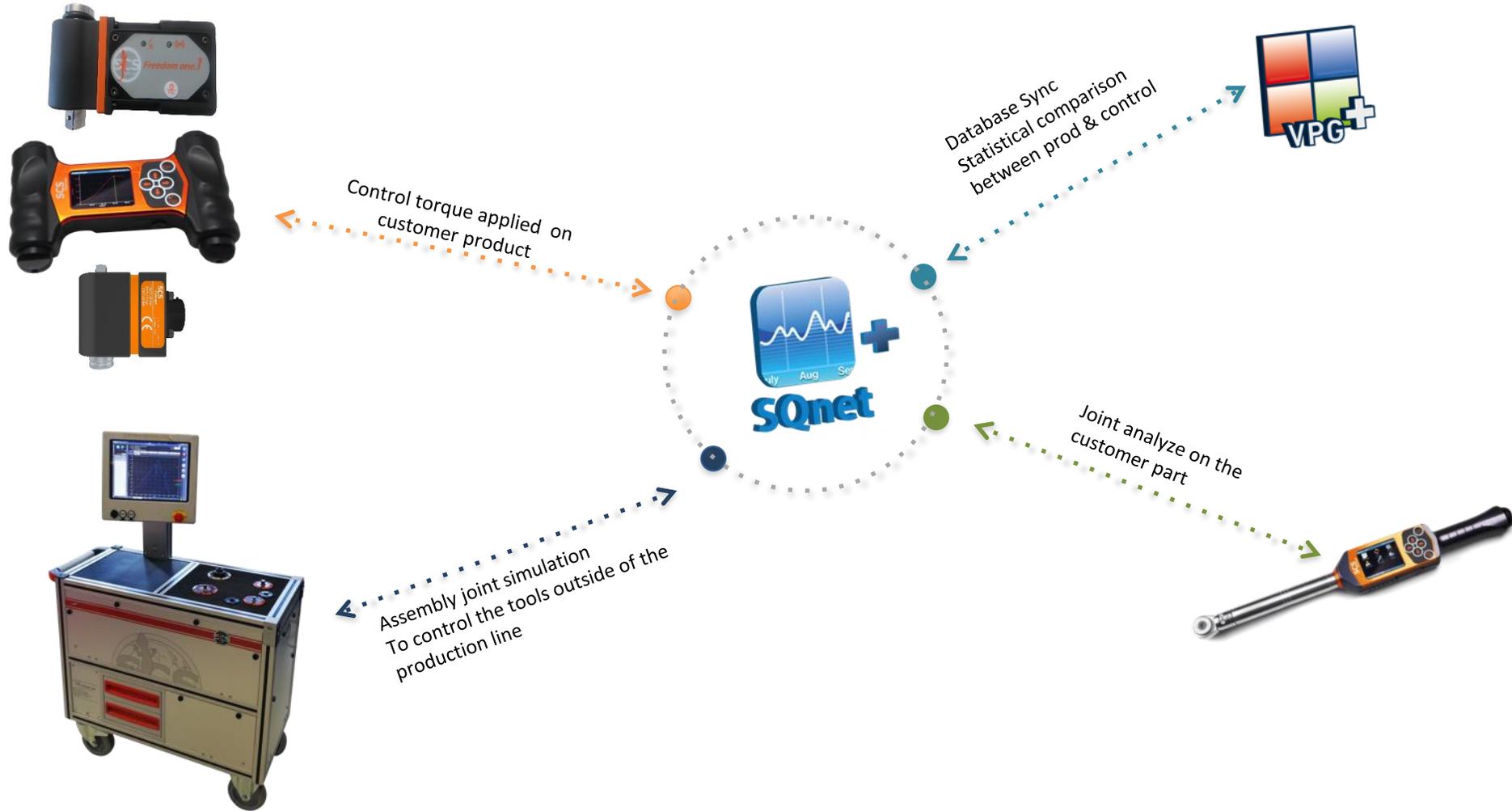


software, guides your production



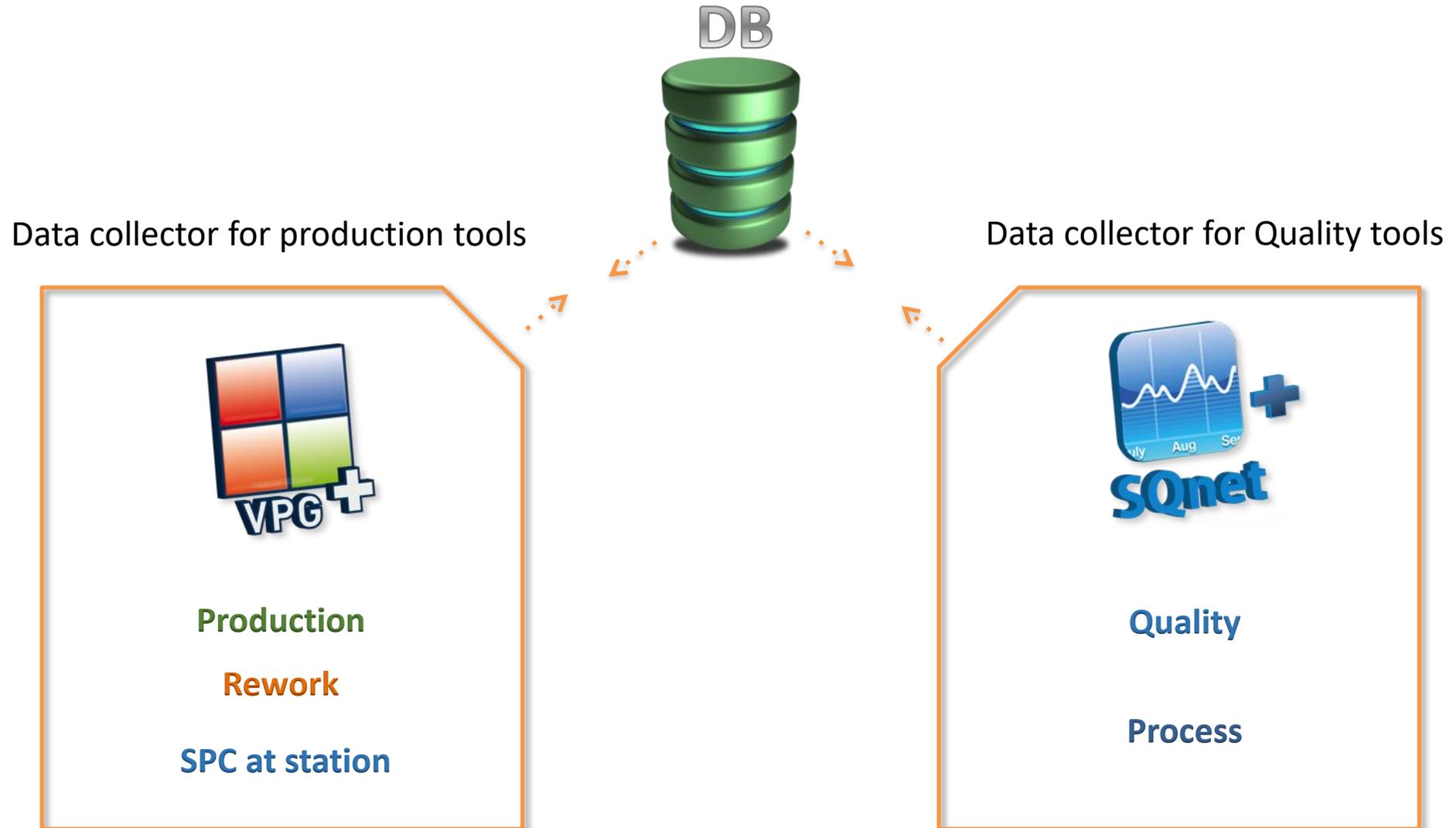


software, quality manager





Visual Production Guide:





VPG software, guides your production



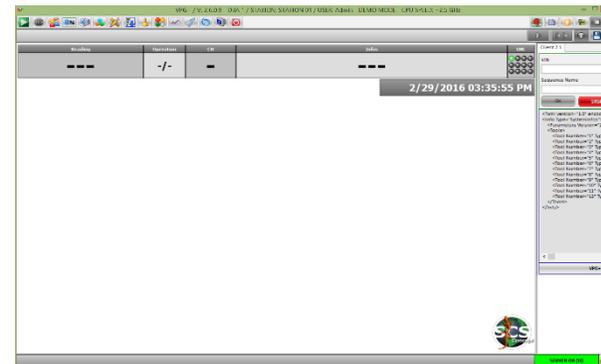
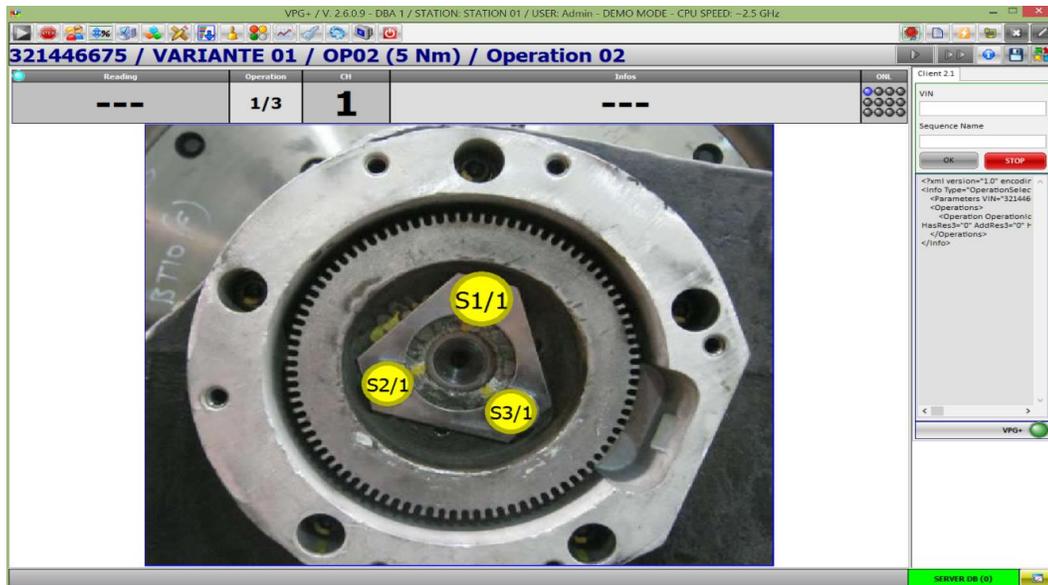


VPG software, guides your production

VPG Software (Mode 1: Stand alone station)

can be as simple as Operator Guidance:

- Station Operator guide
- Training tool for new operator
- Connect other vendor tools to Operator/visual guidance
- 20 different tools can attach to a station
- Simple error proofing in station for all tools



VPG Software (Mode 2 : Data collector)

- Data collection with:
 - Oracle
 - Microsoft Access
 - Microsoft SQL Server
 - SQLite
- Any SCS Concept tool can report
- Multi-brand tools through Open Protocol can collect data, show HMI or Operator guidance, and error proofing in station.
- Some proprietary protocol like Cleco & AMT, etc





VPG Software (Mode 3)

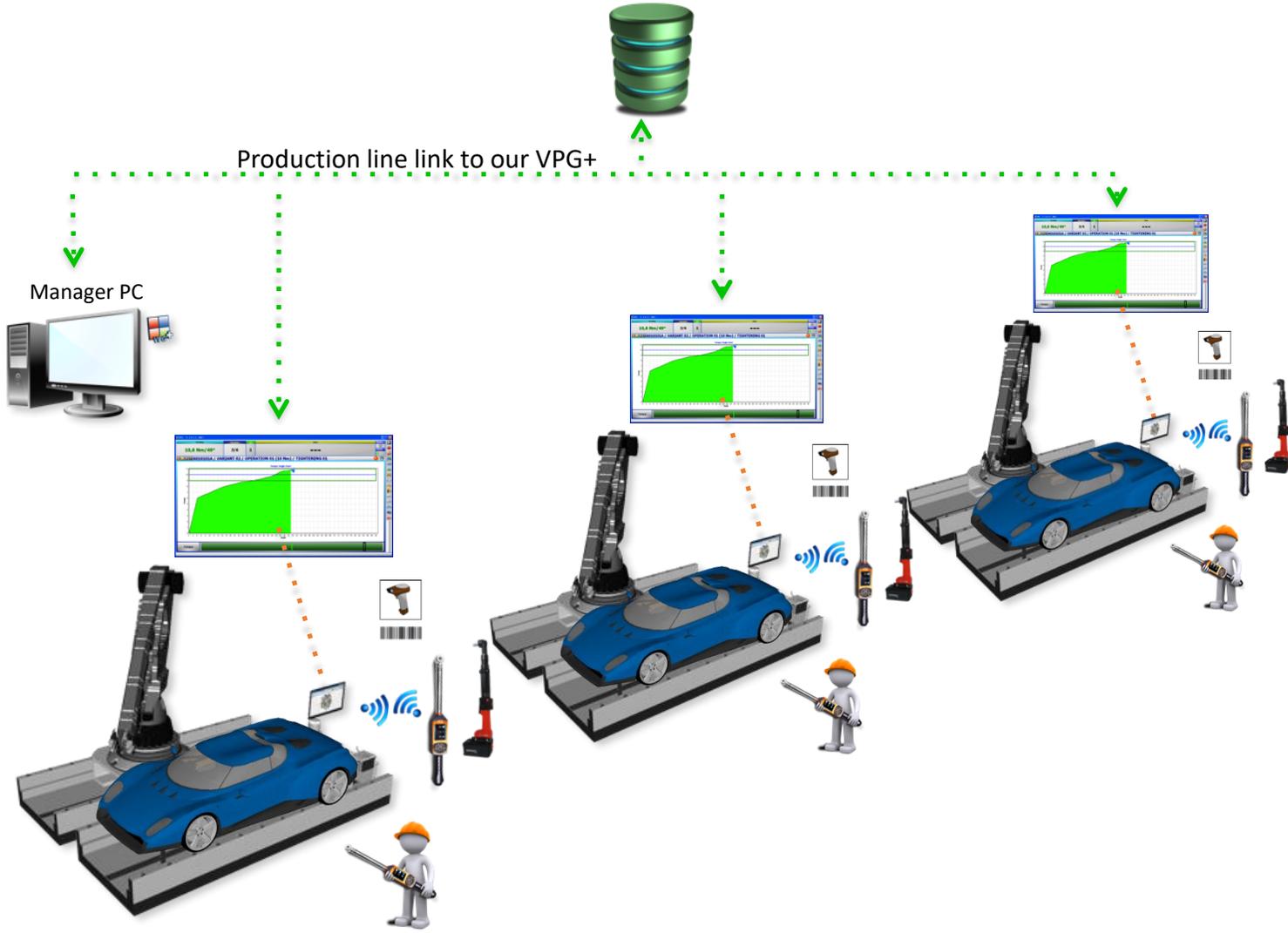
Production

Full production line control

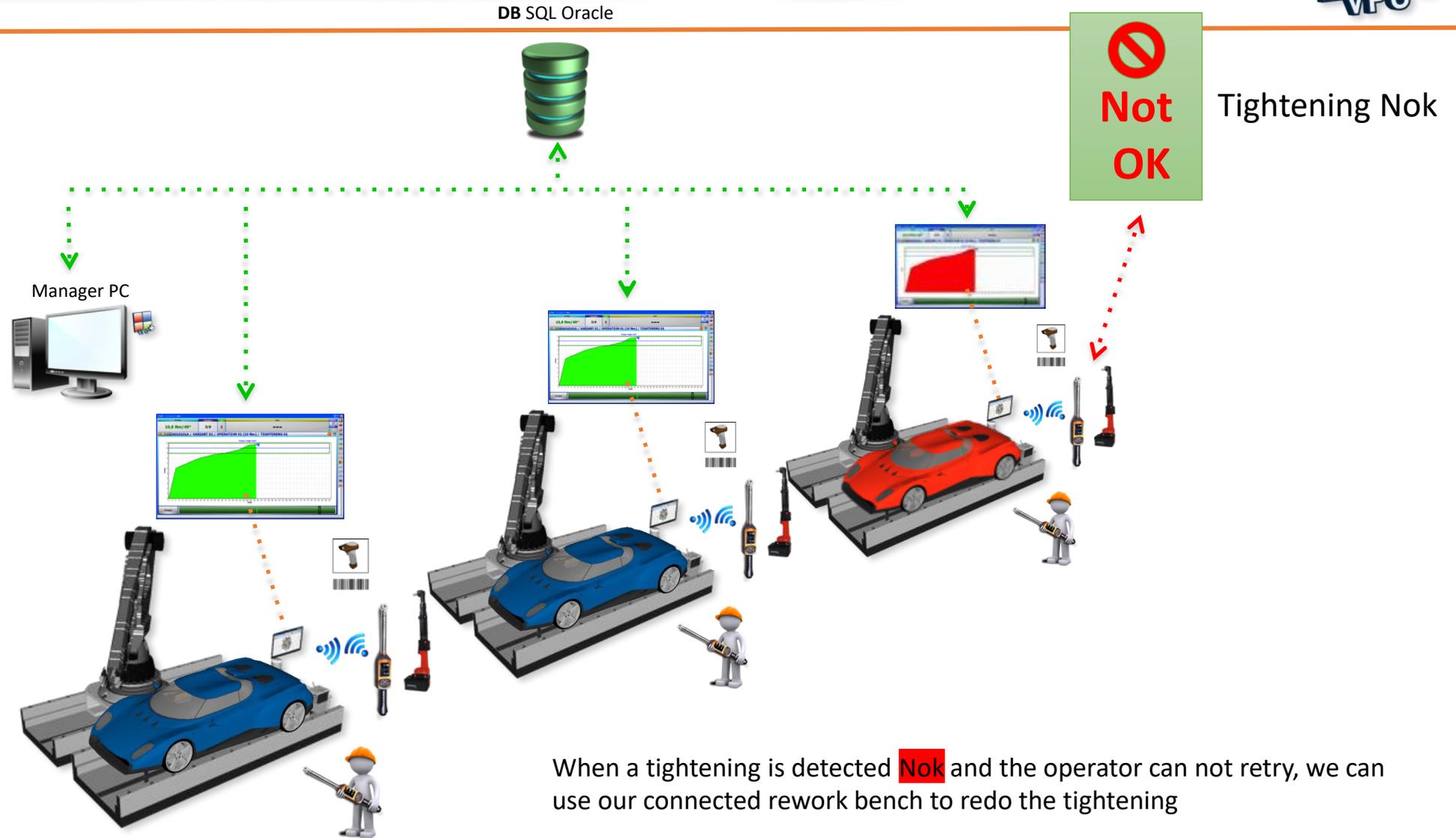


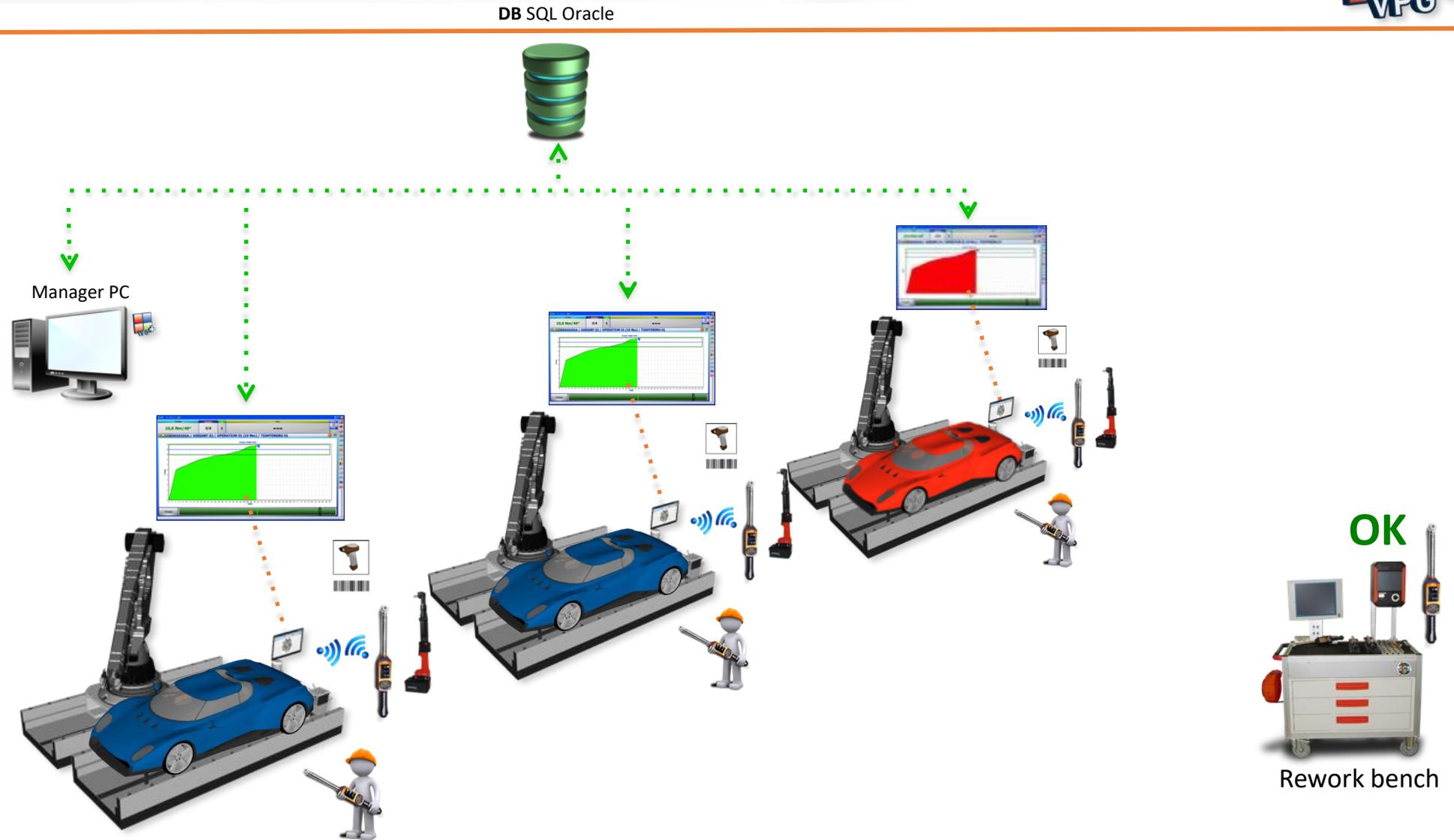
Production: Rework bench link to VPG

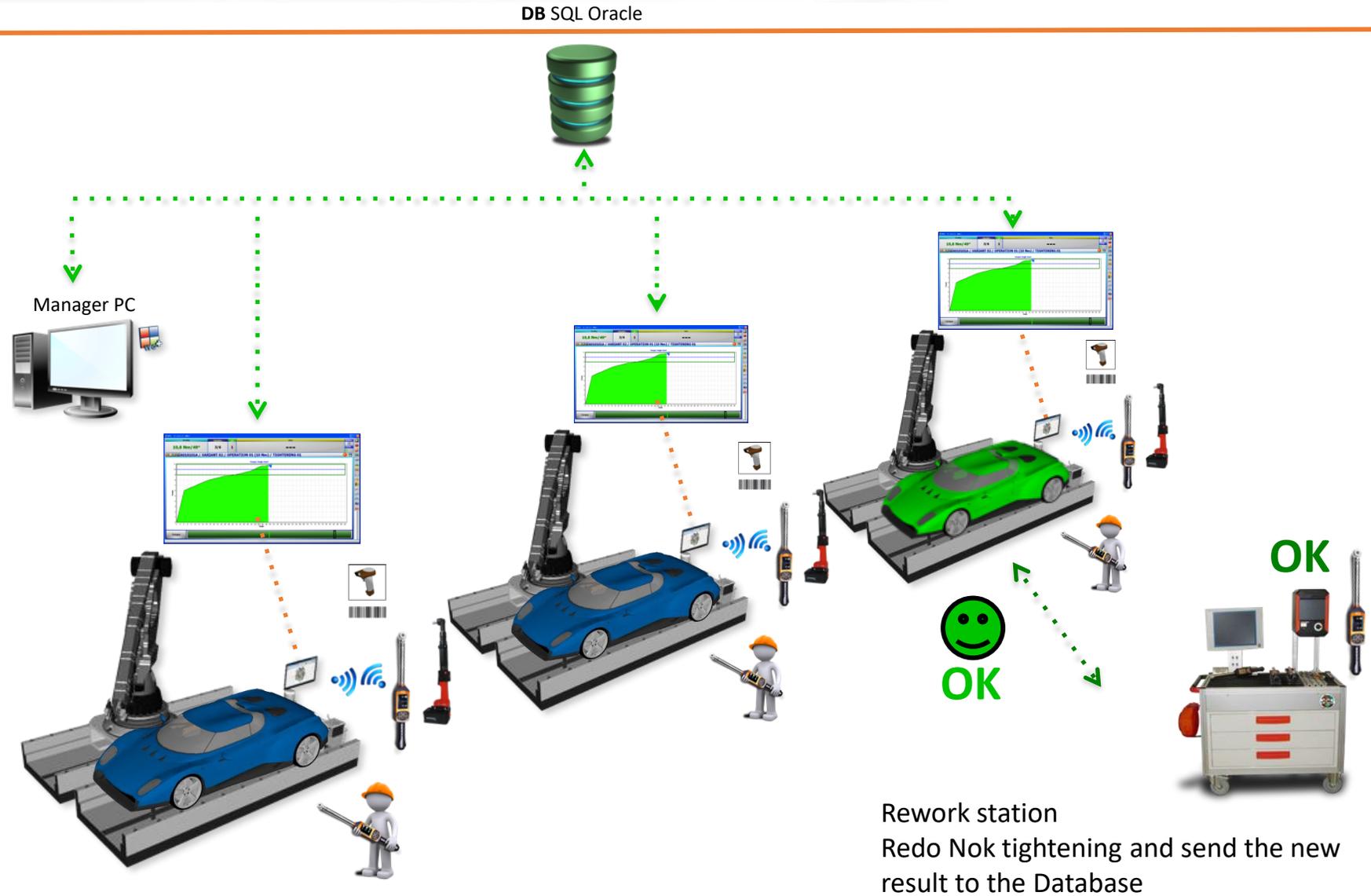
DB SQL or Oracle



- Data Collection
- HMI solution
- Plant management
- VIN management
- Global overview
- Alarm management
- Export XML management





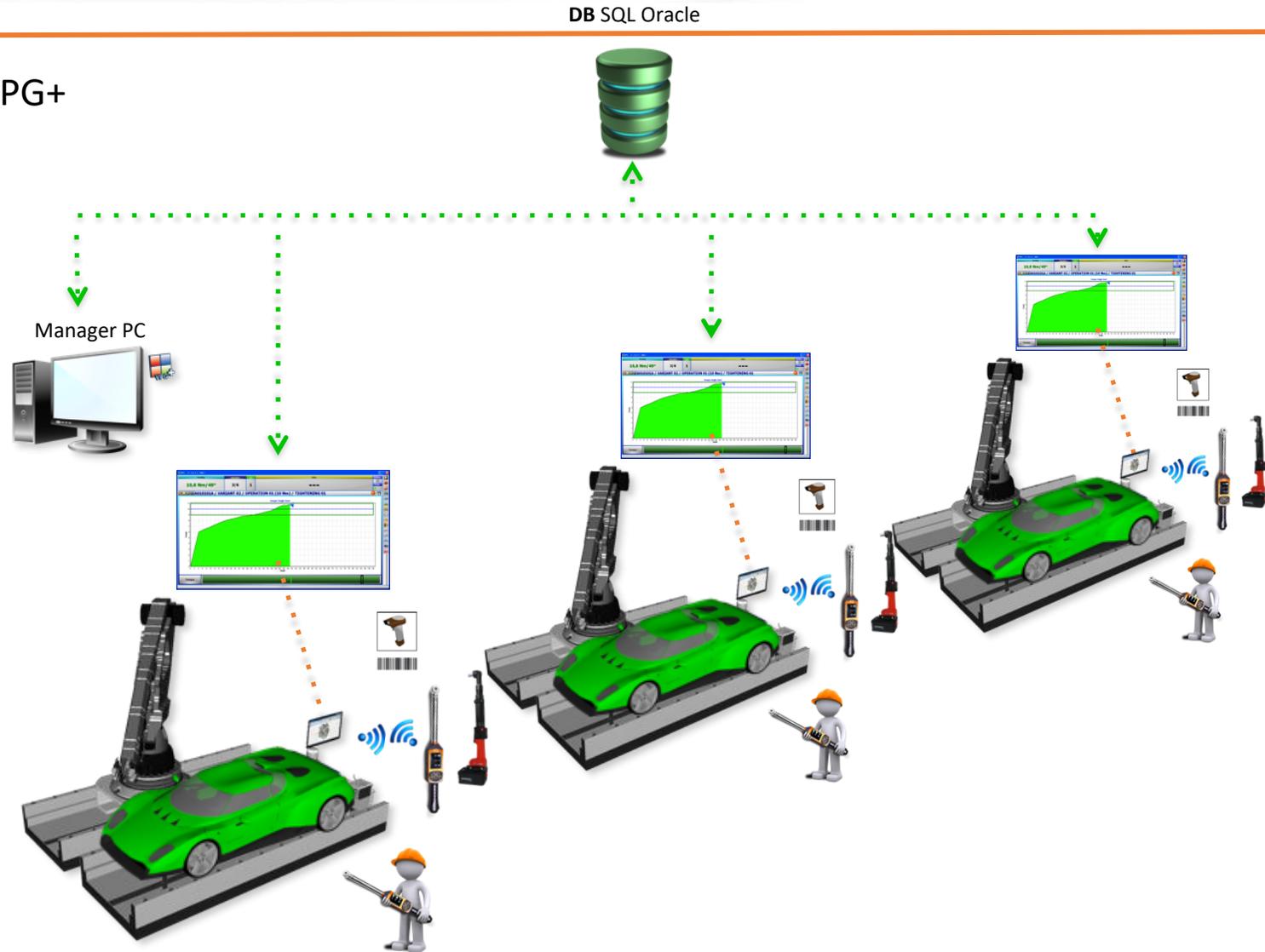




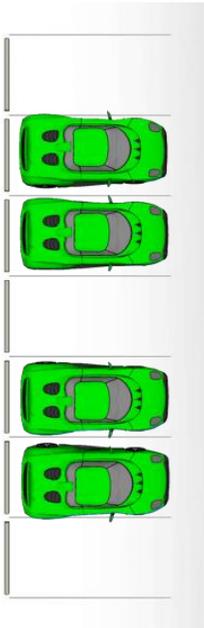
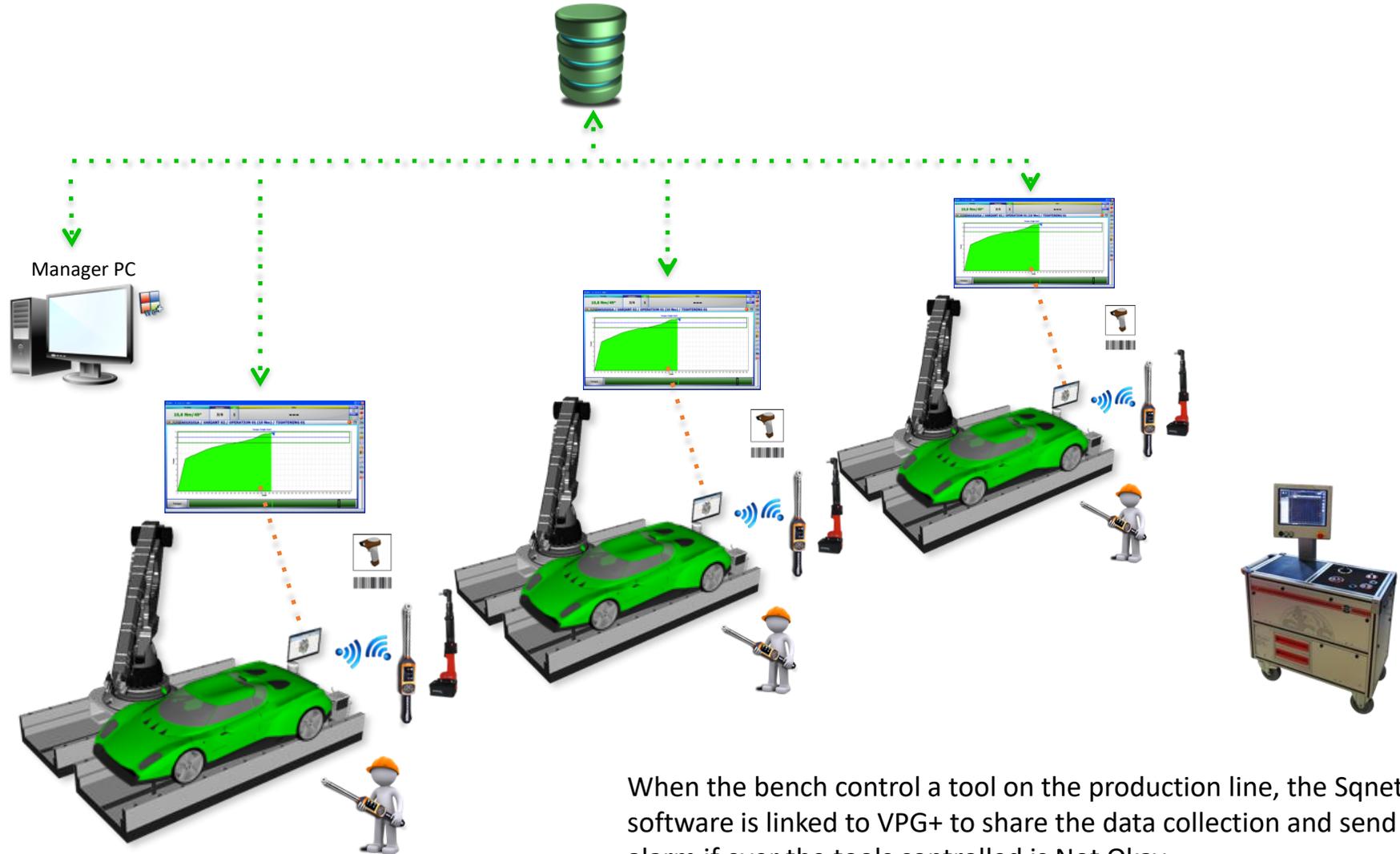
Quality

FTY bench connected to SQnet + and VPG+

- Manage the frequency of control
- Statistic analysis of the tools
- Production line quality improvement
- Reports and statistics
- Structured data and traceability
- Connectivity with all SCS reporting capable products
- Custom functions per customer need
- Alarm management



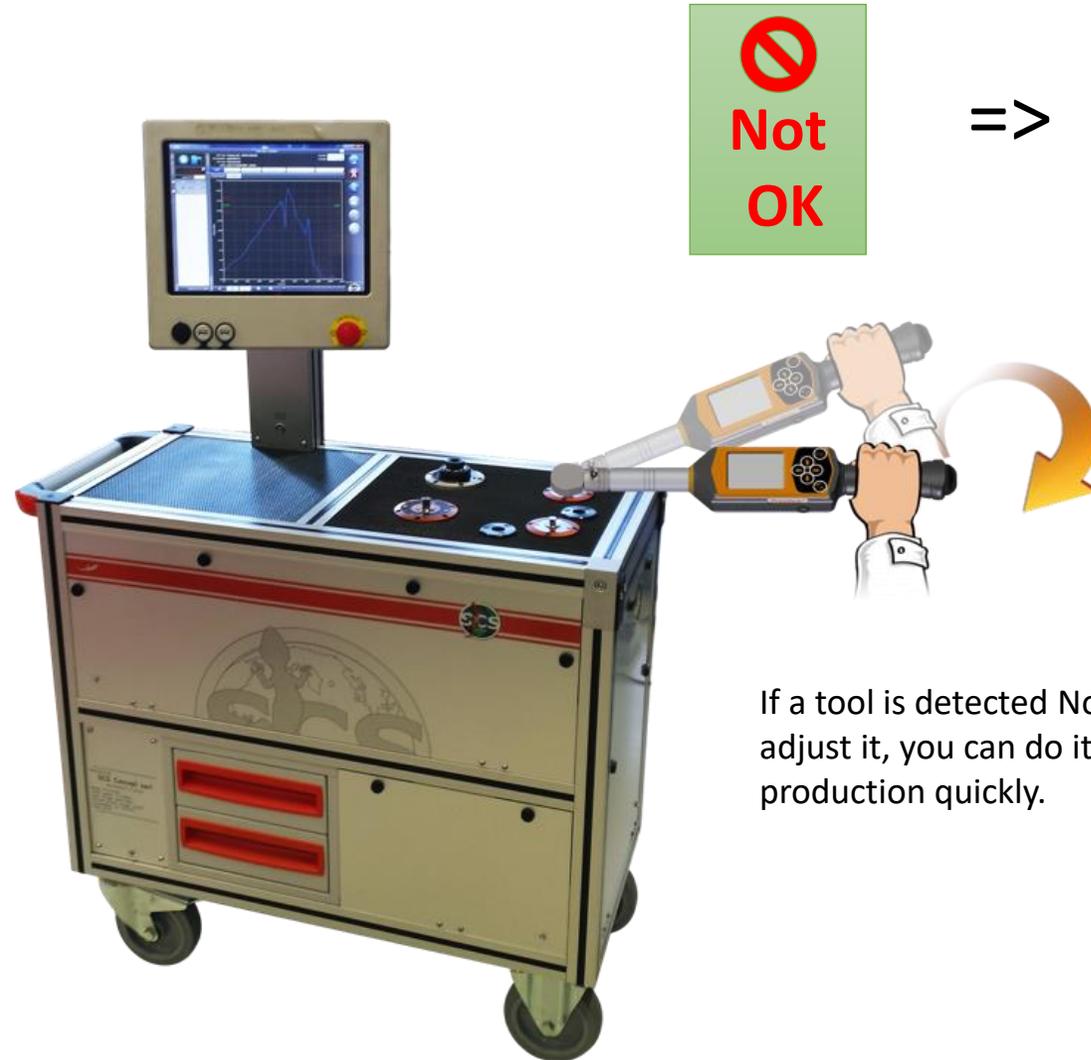
DB SQL Oracle



When the bench control a tool on the production line, the Sqnet+ software is linked to VPG+ to share the data collection and send an alarm if ever the tools controlled is Not Okay

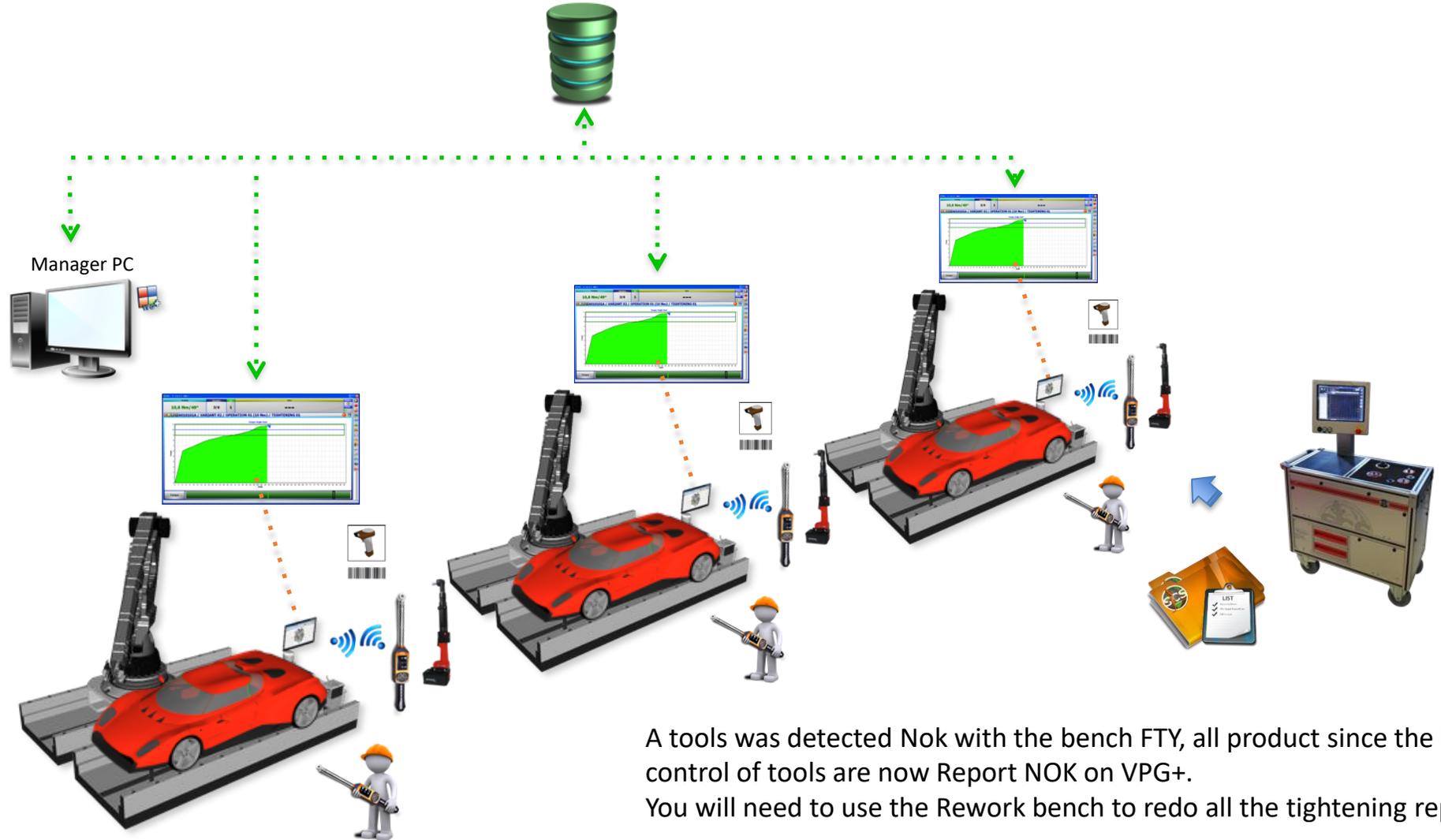
The FTY bench is design to control any tools from production line and to send the data to Sqnet+ to be able to react on live if a tool is detected Nok

- Tool test: wrenches (electronic/digital, click), pneumatic, electric and battery tools, pulse tools
- Statistical Process Control: Measurement of machine capability (Cm, Cmk) and X, R charts
- Test according to ISO 6789, ISO 5393 & VDI
- Fast and easy setup
- Click point auto detection feature for click wrenches
- Comparative test capability
- Mechanical wrench loader for torque wrenches
- External transducer connectivity for special tests
- Standalone programming or program with SQnet+ quality management software
- Joint editor for non-linear joints “multistep simulation”



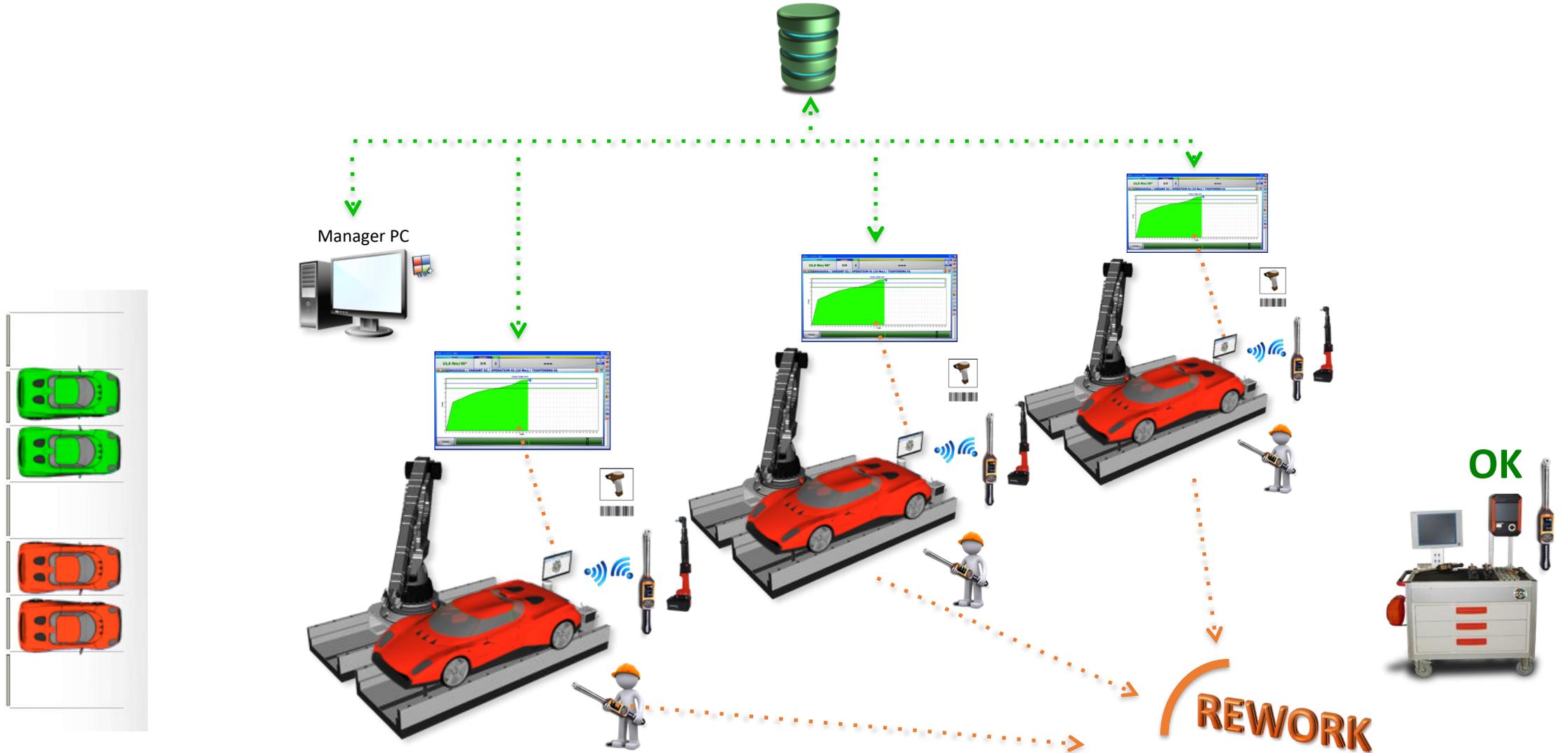
If a tool is detected Nok and you can adjust it, you can do it on live to restart production quickly.

DB SQL Oracle

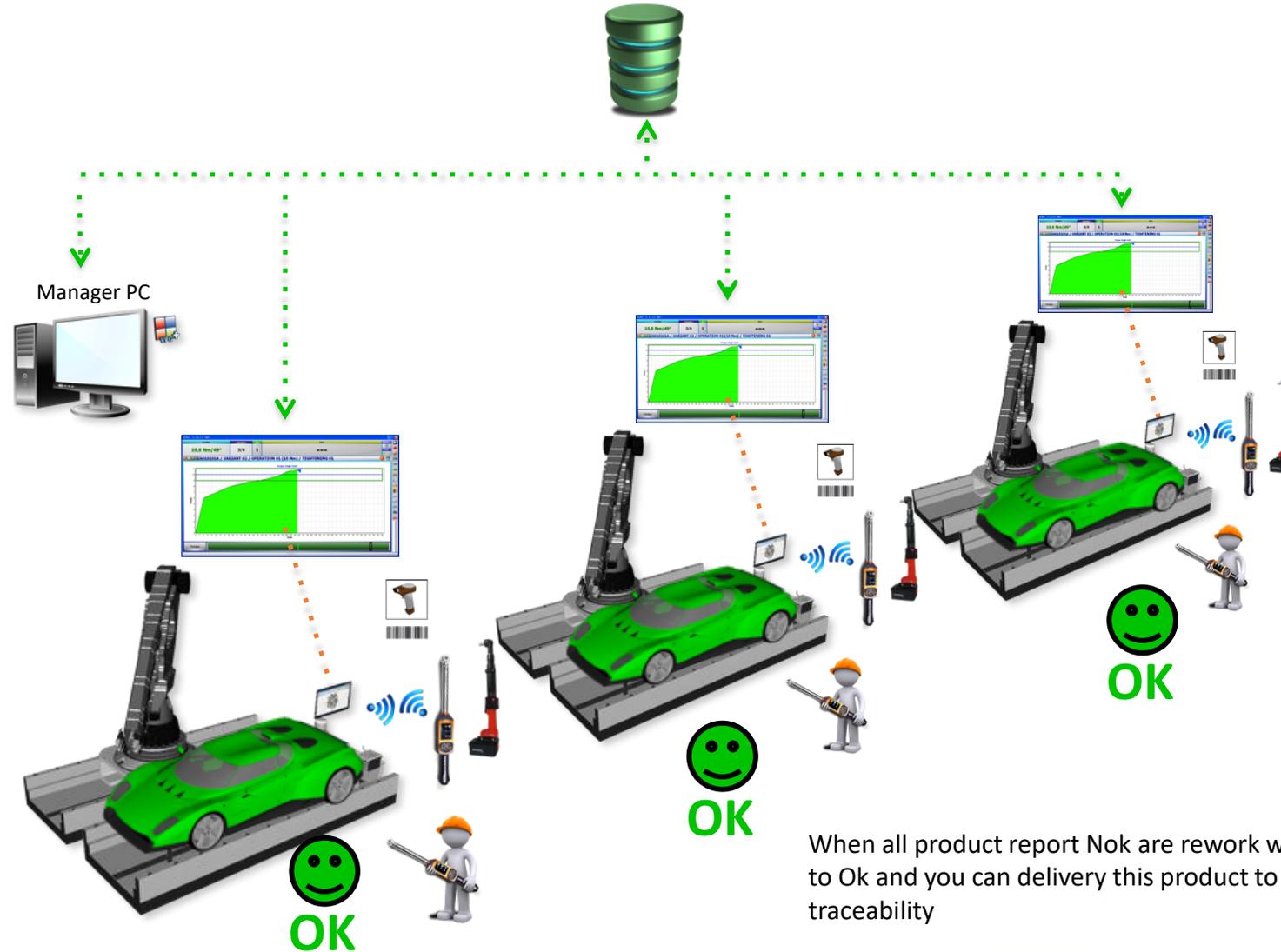


A tools was detected Nok with the bench FTY, all product since the last control of tools are now Report NOK on VPG+. You will need to use the Rework bench to redo all the tightening report Nok

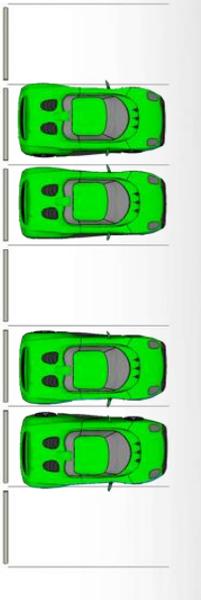
DB SQL Oracle



DB SQL Oracle



When all product report Nok are rework with the bench, the status change to Ok and you can delivery this product to your customer with a full traceability

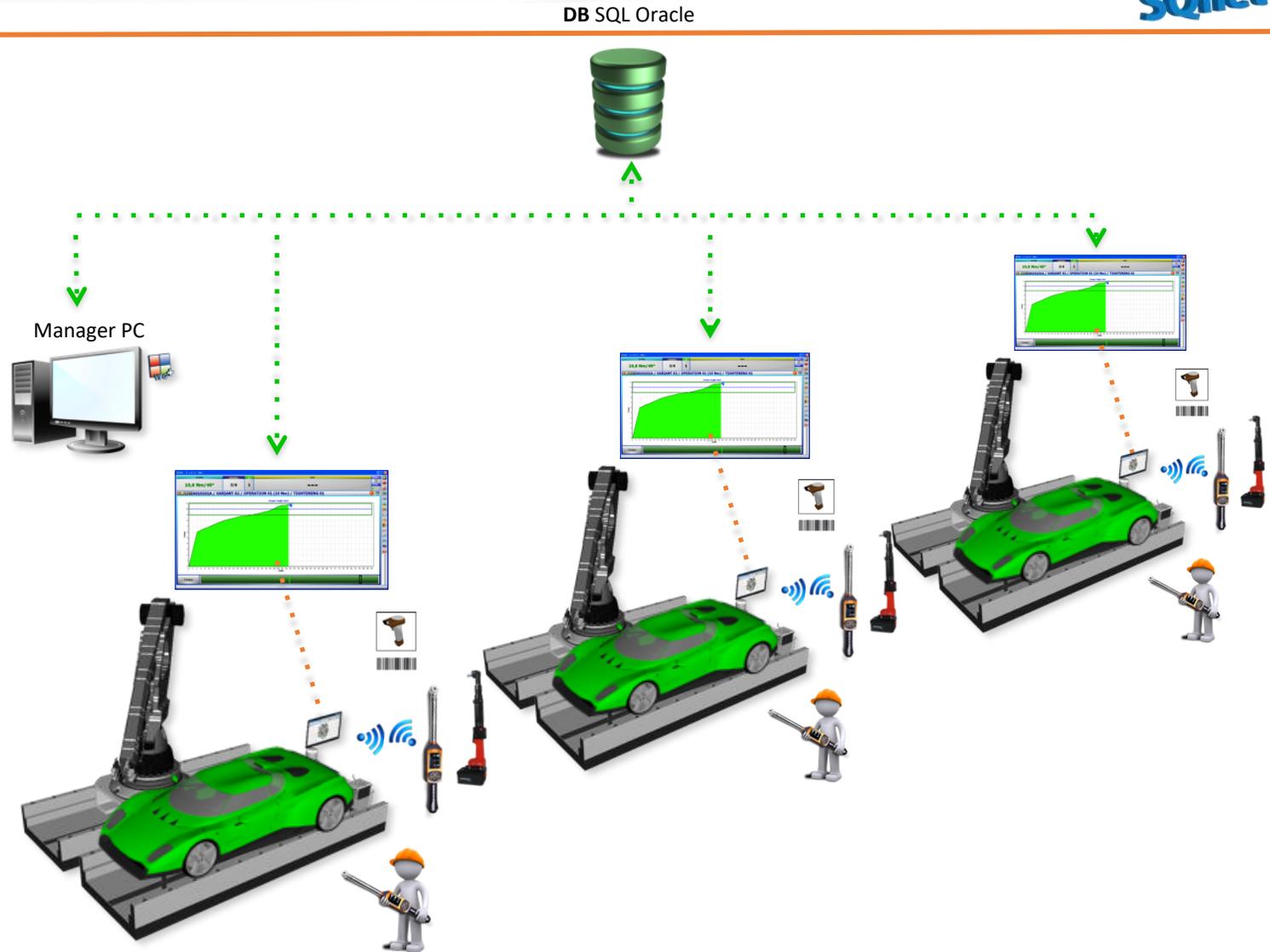


Process

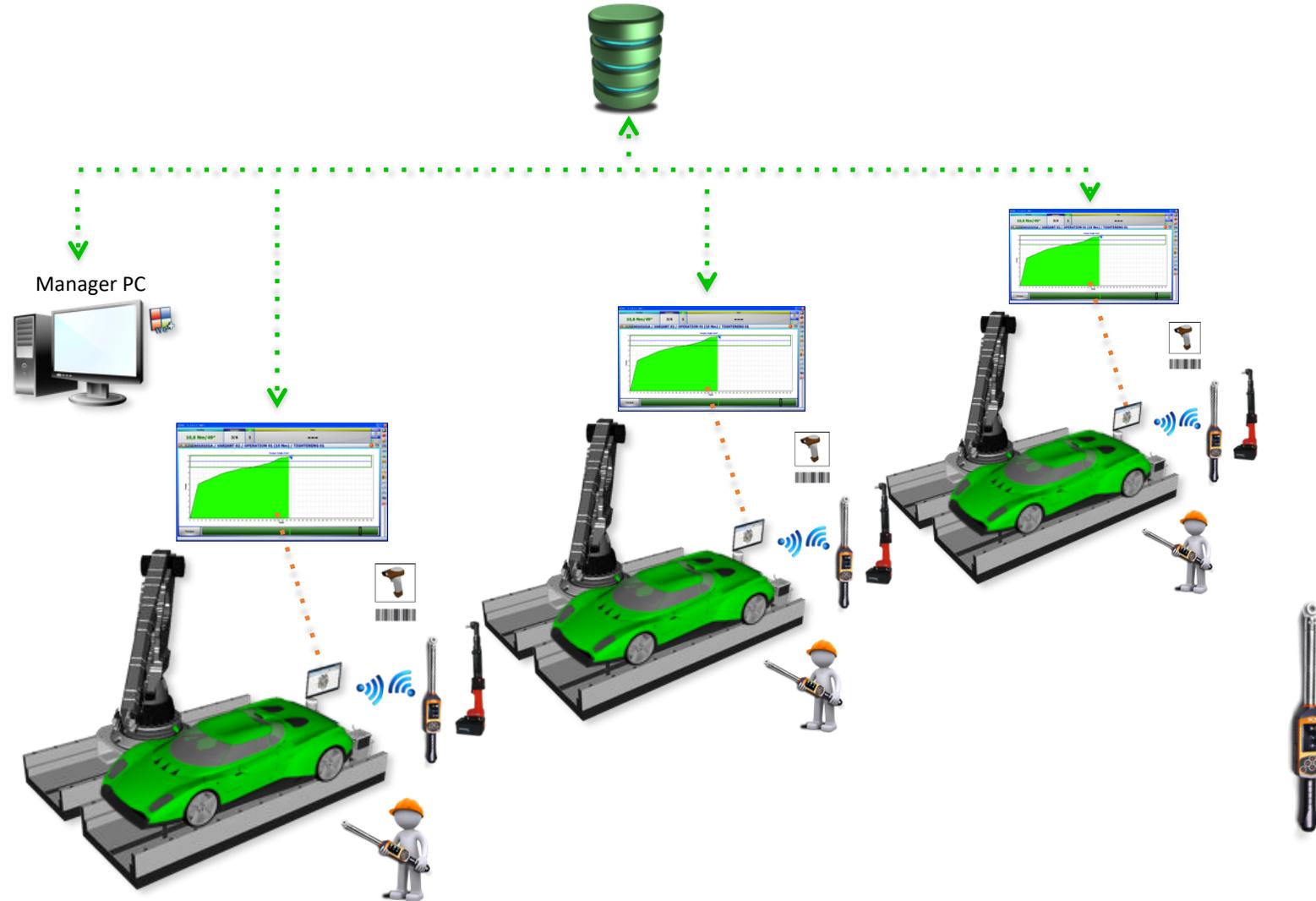
Integration of Process control on the production line, SPC management from Sqnet+ or VPG+ can help youn to analyze if the torque applied on the assembly joint with the tool is Okay or not

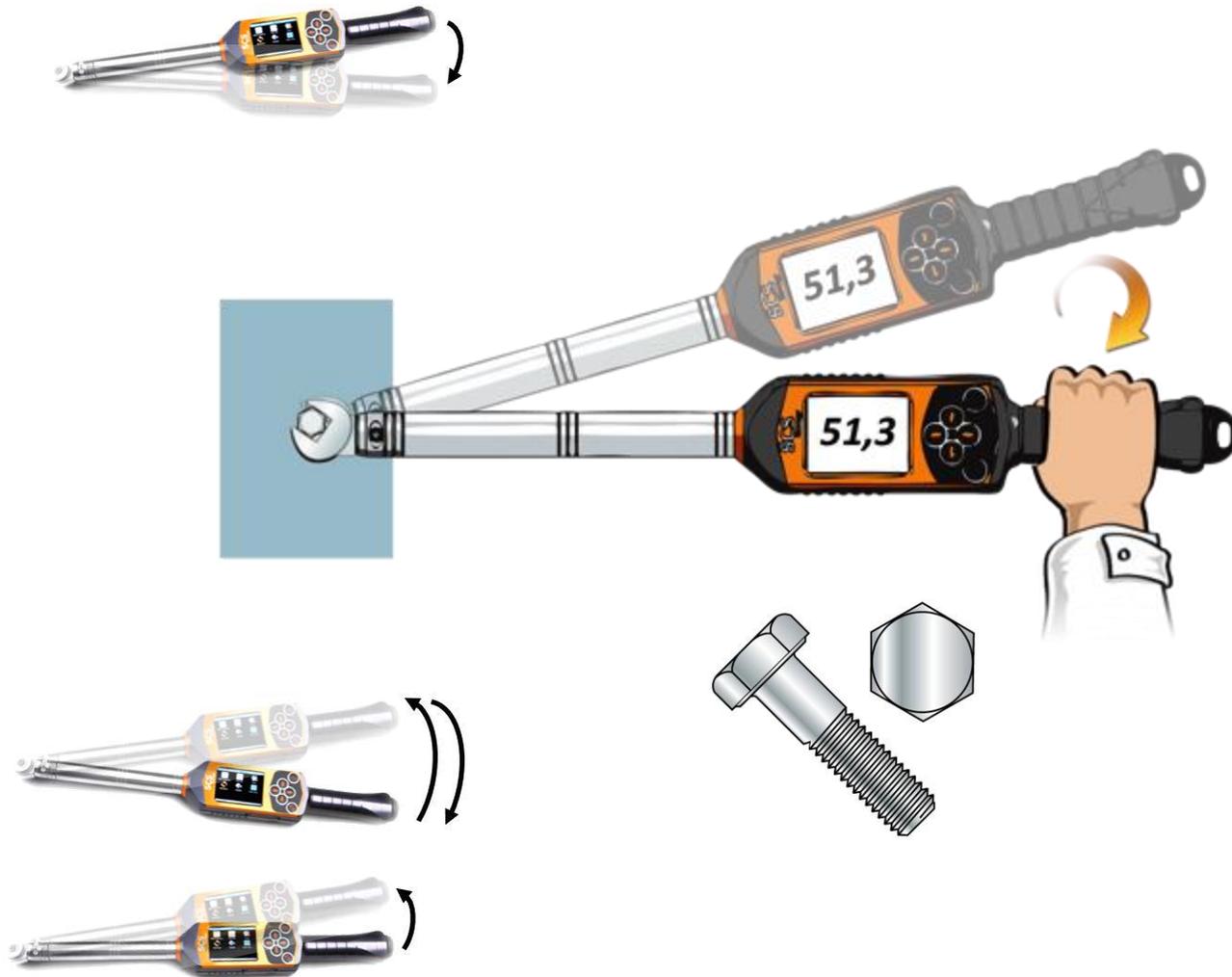
SPC Management

- Check the assembly joint result with Residual torque or other strategy
- Residual torque check on a production line
- Route and job management via software (SQnet+ or QS Torque)
- Wireless programming
- Data traceability
- VIN management
- Connected to Sqnet+ or VPG+, manage alarm if a joint is detected Nok



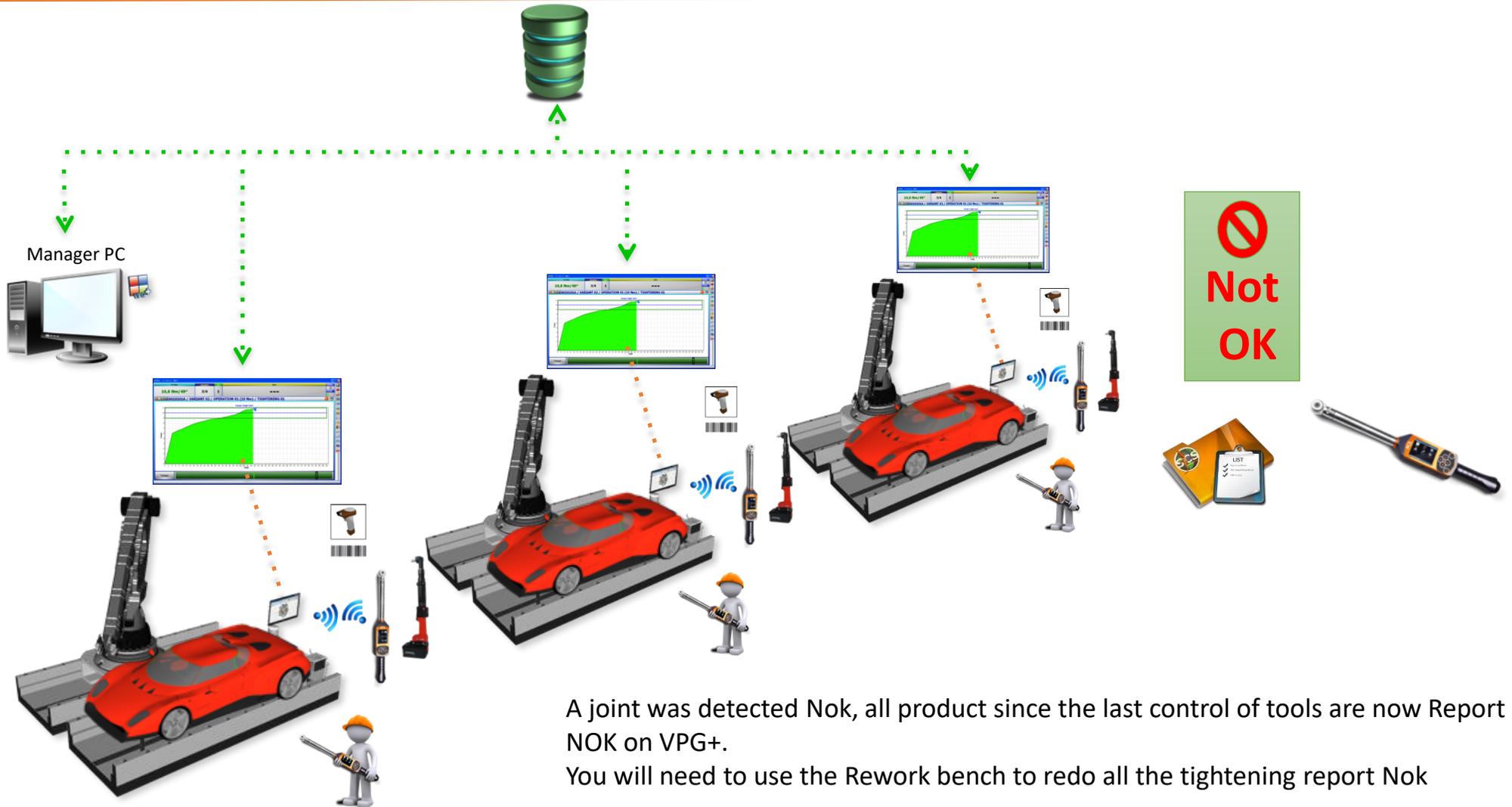
DB SQL Oracle





Detect if the torque applied on the assembly joint fulfill the customer requirement

DB SQL Uracie

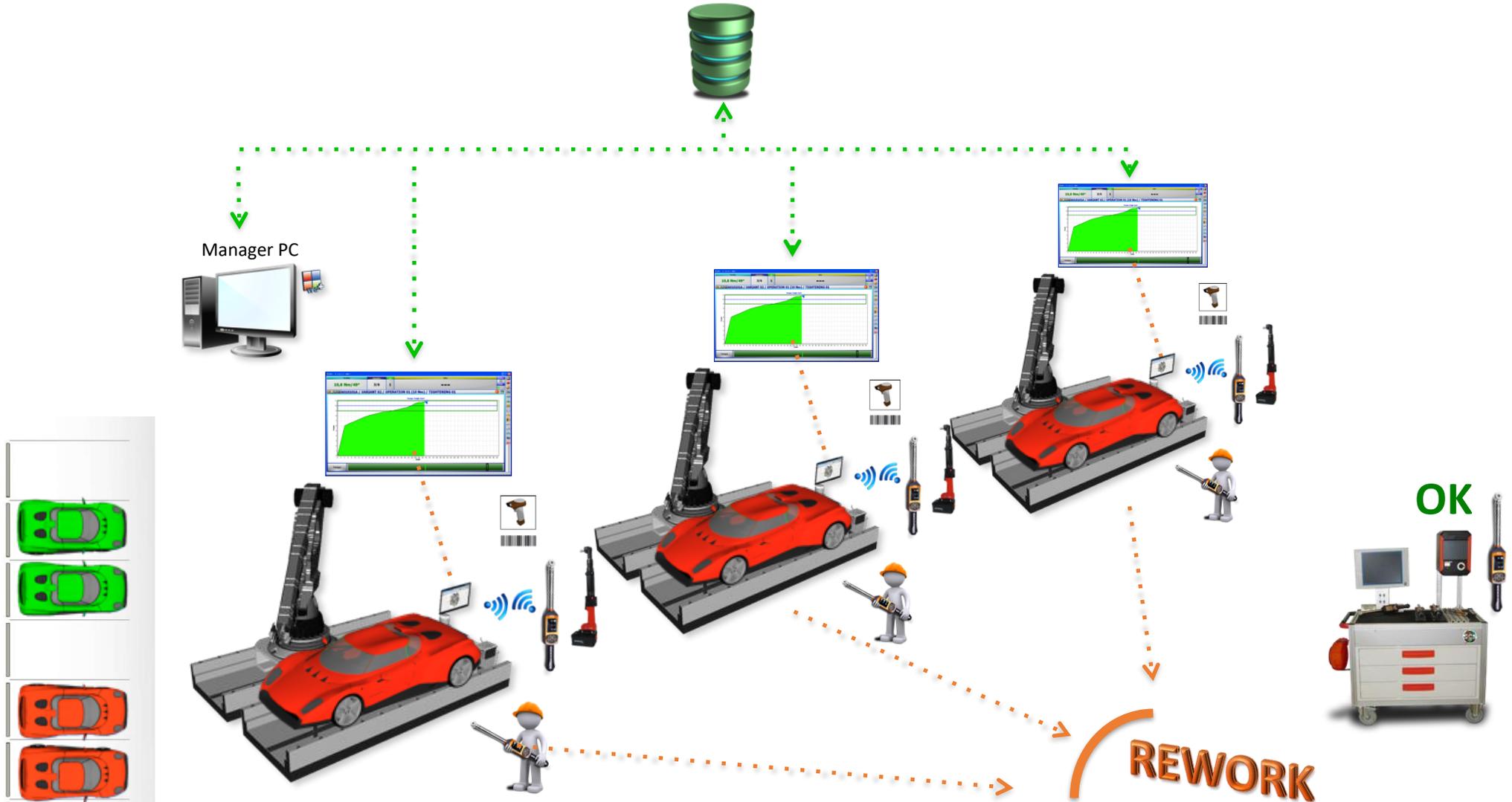


A joint was detected Nok, all product since the last control of tools are now Report NOK on VPG+.

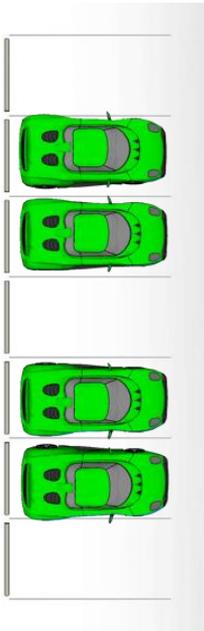
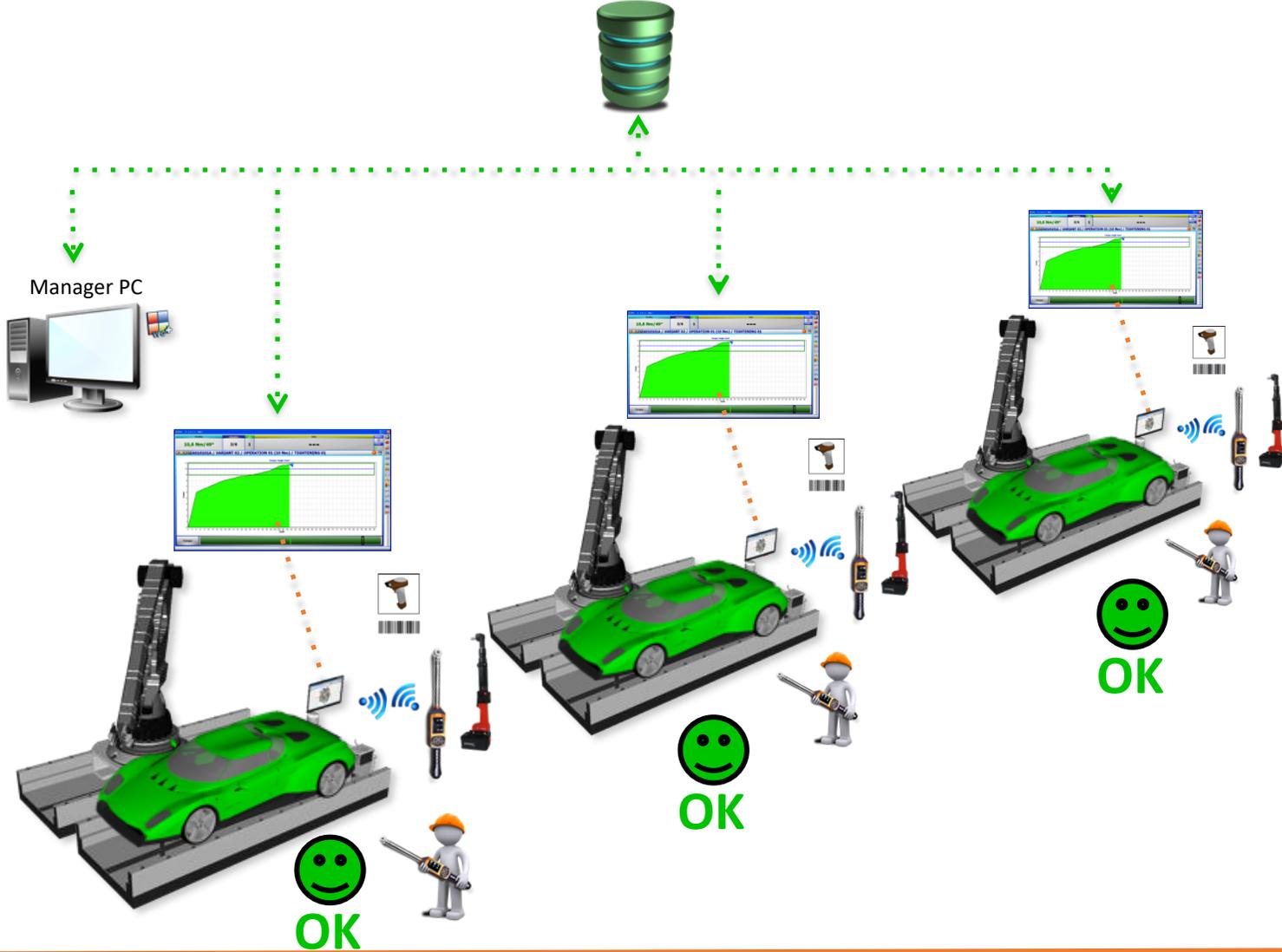
You will need to use the Rework bench to redo all the tightening report Nok



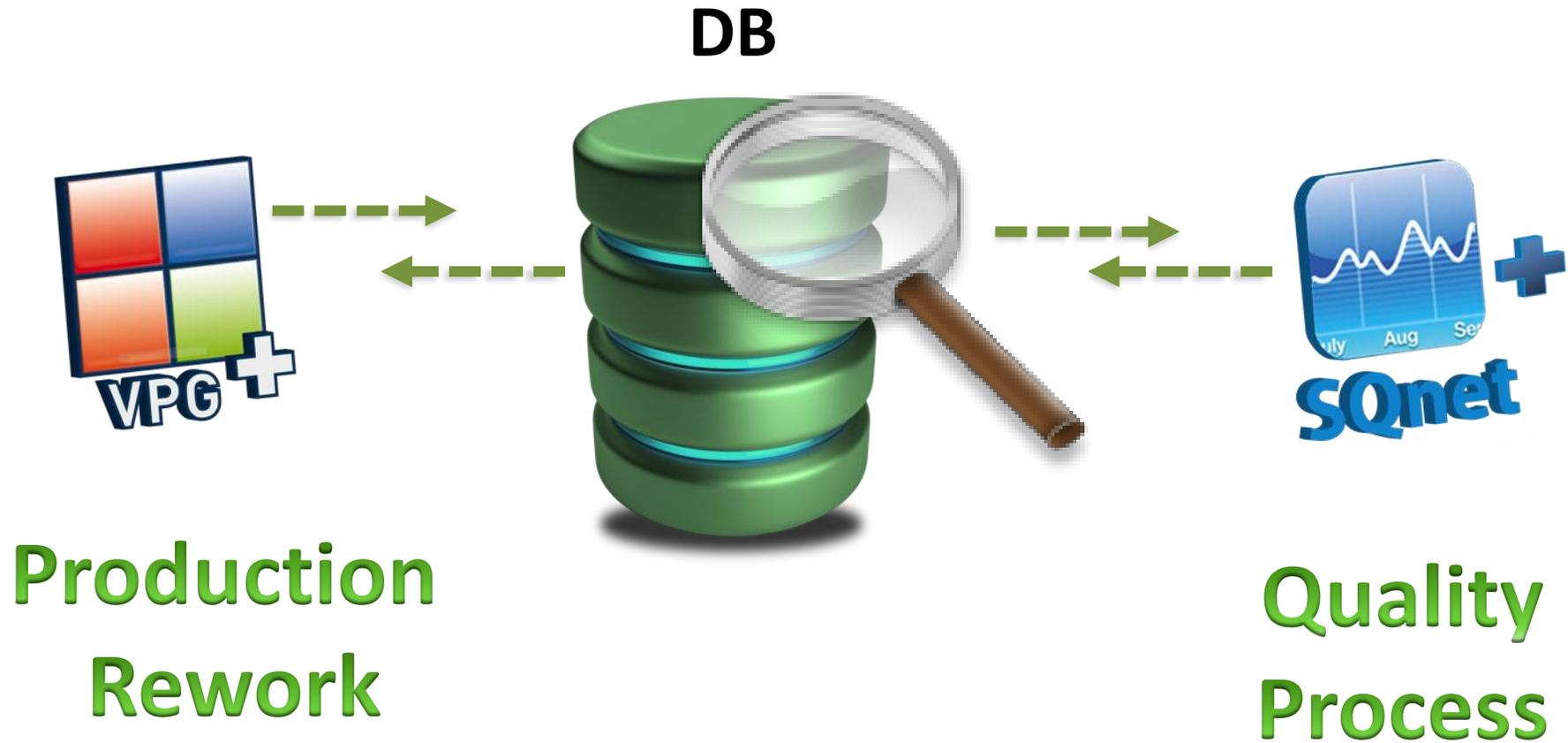
DB SQL Oracle

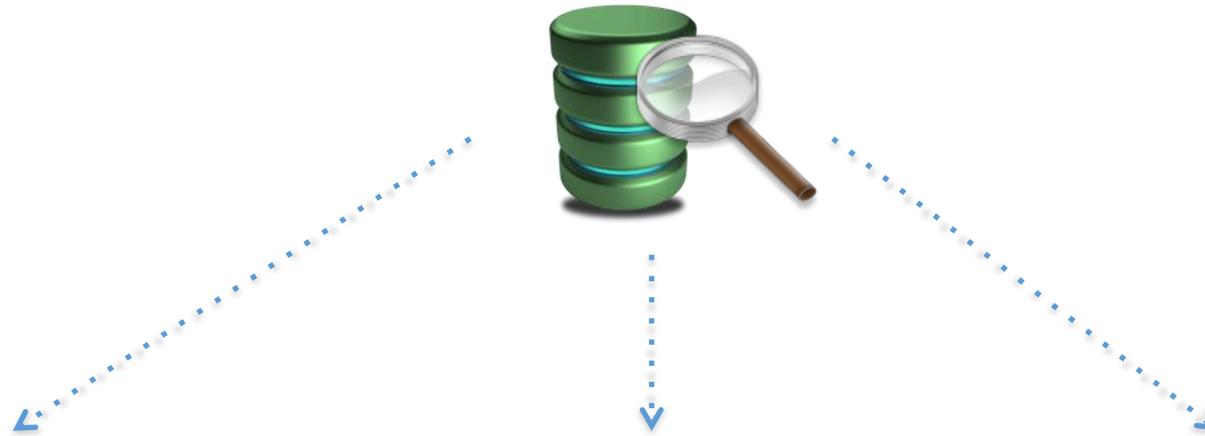


DB SQL Oracle

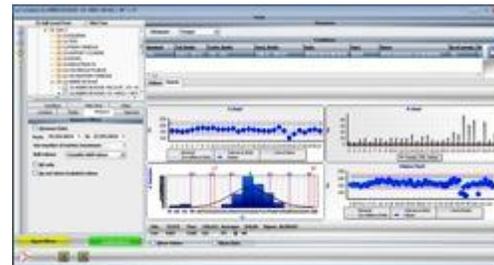


Data analysis





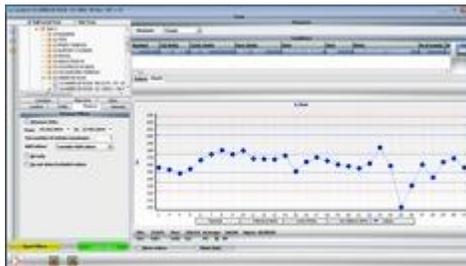
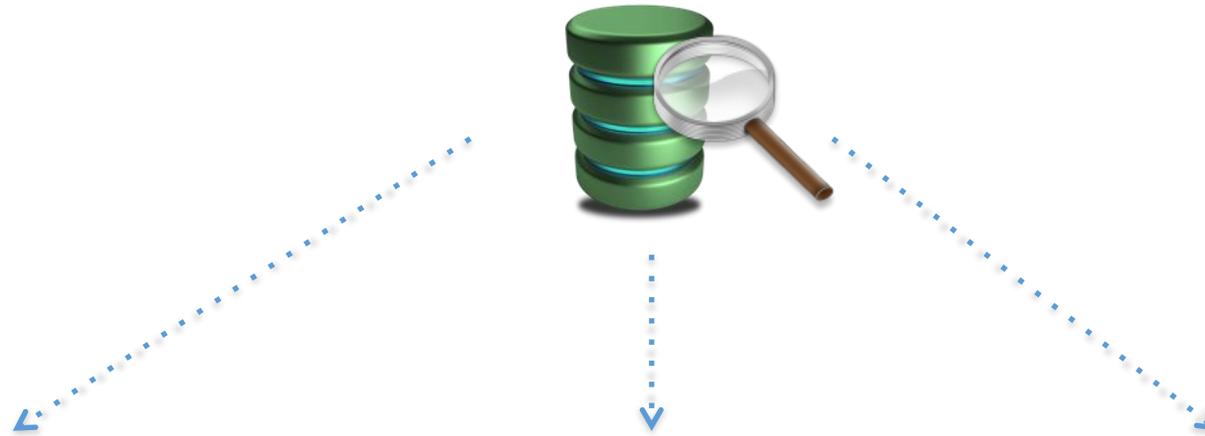
Result with Filter



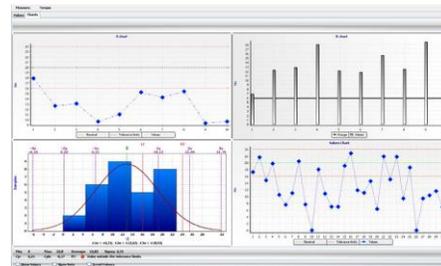
Cp / Cpk
Or
Cm / Cmk



Trace comparison



values chart



X/R Chart
Gauss & values chart

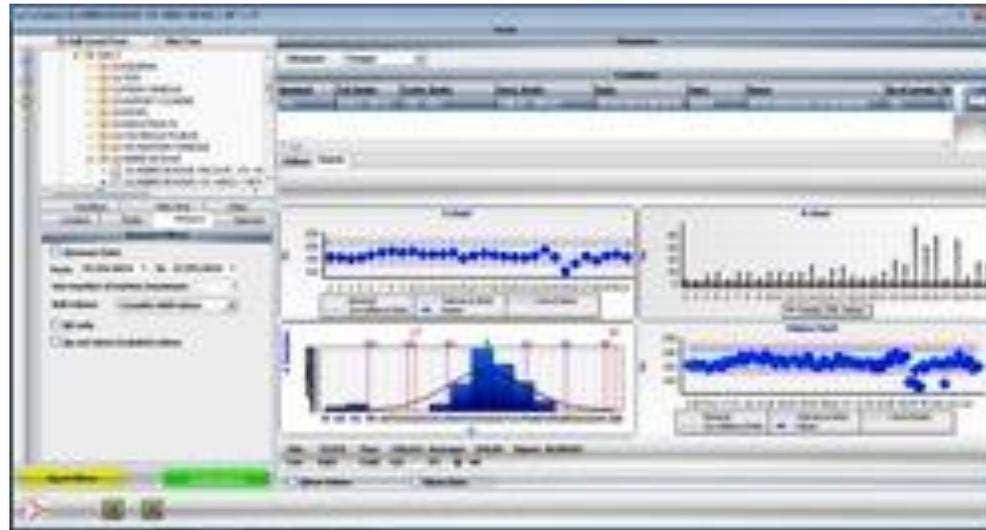


Customized
your tolerances

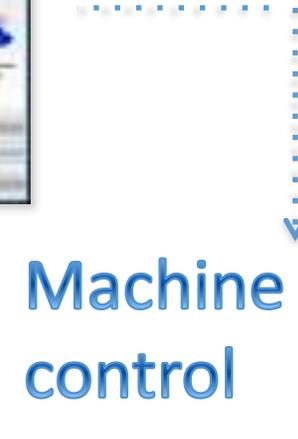
Statistic control : X, R charts, Cm-Cmk / Cp-Cpk histogram and all the values graph.
Other test type : Cm-Cmk / Cp-Cpk report, ISO 6789 and ISO 5393 report.



Production data



Process control



Machine control

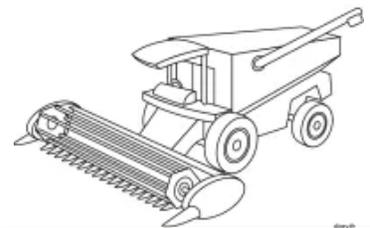
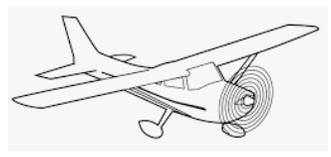




Main Market interested by VPG & Sqnet +

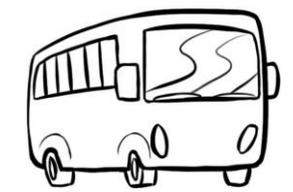
Typical areas of use in production

- Brake lines
- Replacement of crowfoot tool & tubenut power tools
- Fuel rails
- Hydraulic Lines
- Bearings (Rolling Torque, gauging applications)
- Oil Pump
- O2 sensors
- Alignment pits
- Smart-Breakaway application in production
- Temporary backup for power tools
- Repair/rework functions
- Torque + Angle joints
- Hard to reach/access applications



Main Market

- Automotive
- Aerospace
- Military
- General industry like truck,





CUSTOMER REFERENCE

FORD INDIA More than 150 workstations (COMPLETE SYSTEM - Client Server)

AUDI GYOR More than 30 reworks bench station to repair the motor in real time on the production line.

MAN Germany Main software for Data collection and assembly process management

HOMME South Africa, Main software for Data collection and assembly process management

BUGATTI France Main software for Data collection and assembly process management

SAFRAN et VW Pamplona More than 4 reworks bench stations

SAFRAN CPD More than 4 workstation managing Wrench and Power tools

Mercedes Düsseldorf, Berlin et les USA more than 60 workstations

BMW Munich and Steyr (Austria) More than 45 workstation

MERCEDES BRAZIL - Truck: more than 40 workstations.

IVECO , Turin more than 50 workstation **Tracking & Traceability Management System** Manufacturing I.T.

MTU more than 40 workstation

Alstom France / Brazil

COLLINS AEROSPACE France 10 stations + 16

Etc





VPG+ : Option

Workstation SPC control solution

Ref : 102 21 9002

Compare Torque apply by the production tools with the quality value (Residual or other strategy)
Manage a campaign of control at your workstation and do some statistical analysis

Description

Group
(None) +

Models

- CUSTOMER
 - ALFA GIULIETTA
 - modello 1
 - modello 2
 - ALFA STELVIO

Sequence type
 Production Rework SPC

Sequence mode
Sequential

Allow the selection of the operations Show progress

Station
 + Timeout (seconds)

PLC Program/Channel Job name

Position program Job name - F3: ***
 Add a logical operation on socket change

Rework options

Rework

Production

SPC

Batch mode

off

Control sequence

Sequenza Imola

- OPERATIONS - Smart breakaway
 - SACMI ant. / serraggio anteriore - 5n
 - SACMI post / serraggio posteriore - 5
 - 1122334455667788 / TEST - Smart b
 - 1/10 - Smart breakaway [CH 0]
 - 2/10 - Smart breakaway [CH 0]
 - 3/10 - Smart breakaway [CH 0]
 - 4/10 - Smart breakaway [CH 0]
 - 5/10 - Smart breakaway [CH 0]
 - 6/10 - Smart breakaway [CH 0]
 - 7/10 - Smart breakaway [CH 0]
 - 8/10 - Smart breakaway [CH 0]
 - 9/10 - Smart breakaway [CH 0]
 - 10/10 - Smart breakaway [CH 0]

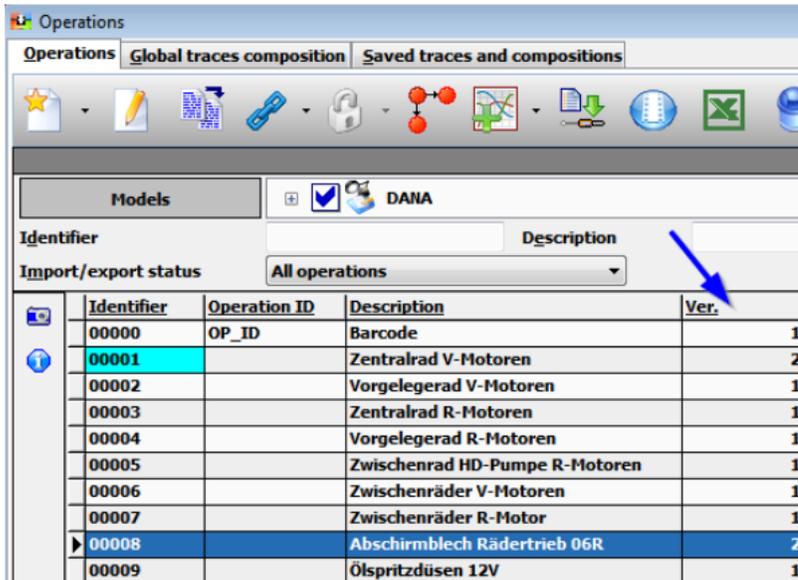
Confirm



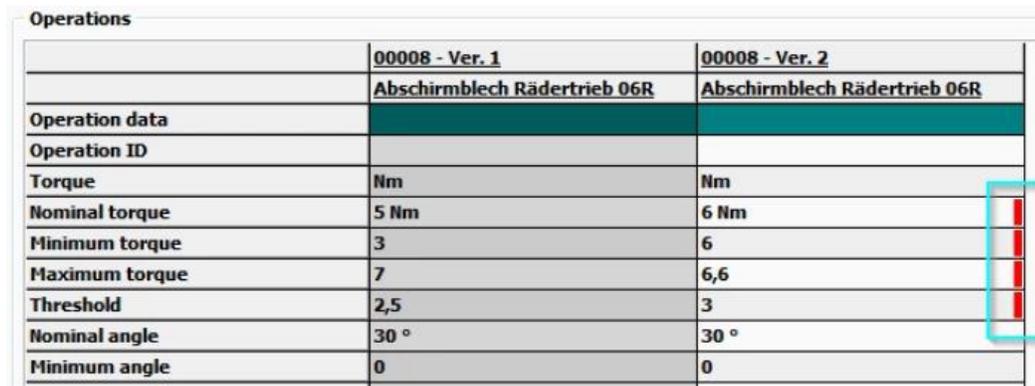
Workstation VPG+ check the operation version and store all update

Ref : 102 21 9007

With this option, you will be able to understand the last update that you do on each operation (Task) and compare it. Follow the date and the name of the operator who change the operation



Identifier	Operation ID	Description	Ver.
00000	OP_ID	Barcode	1
00001		Zentralrad V-Motoren	2
00002		Vorgelegerad V-Motoren	1
00003		Zentralrad R-Motoren	1
00004		Vorgelegerad R-Motoren	1
00005		Zwischenrad HD-Pumpe R-Motoren	1
00006		Zwischenräder V-Motoren	1
00007		Zwischenräder R-Motor	1
00008		Abschirmblech Rädertrieb 06R	2
00009		Ölspritzdüsen 12V	1



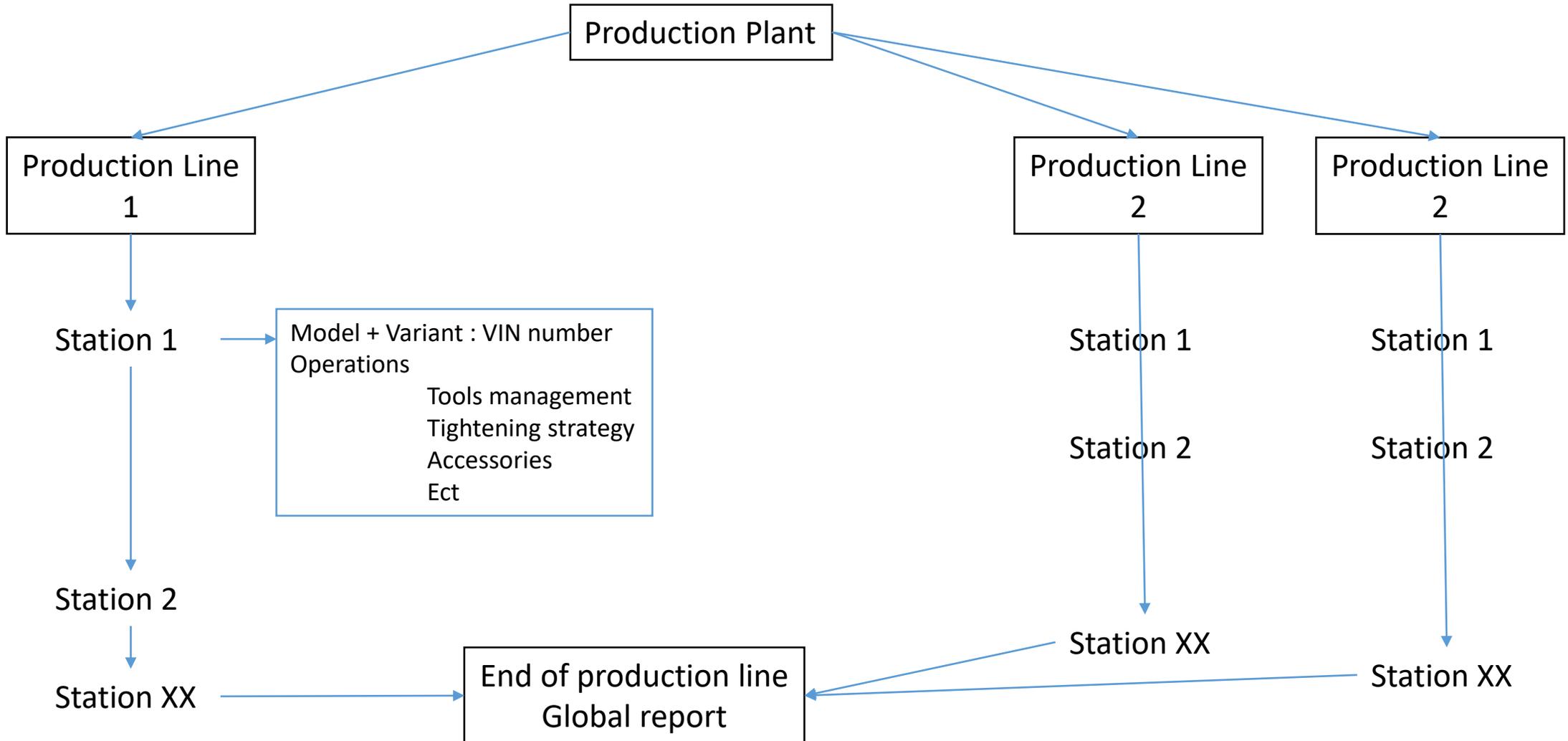
	00008 - Ver. 1	00008 - Ver. 2
	Abschirmblech Rädertrieb 06R	Abschirmblech Rädertrieb 06R
Operation data		
Operation ID		
Torque	Nm	Nm
Nominal torque	5 Nm	6 Nm
Minimum torque	3	6
Maximum torque	7	6,6
Threshold	2,5	3
Nominal angle	30 °	30 °
Minimum angle	0	0



VPG+ : Mains functionalities

1. VPG+ Structure
2. Model & Variant : How to manage the operations
3. How to manage the Update of all stations
4. Communication protocol available between VPG and the other customer software like MES, PLC, Data
5. Manage all other option like : Positioning system, geolocation, socket tray, etc
6. Alarm management : How and to who we send email when we have some alarm, which type of alarm, etc
7. Manage 2 VPG license in one computer with 2 screen, manage external large screen , etc
8. Live trace
9. Manual interface Human machine => our ability to build an operation without any tightening, just a human validation
10. Automatic XML export ???
11. Operation comparison

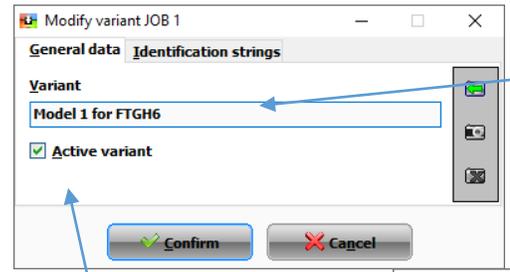




2. Model & Variant : How to manage the operations



Model : VM car



Variant Definition
+
String management

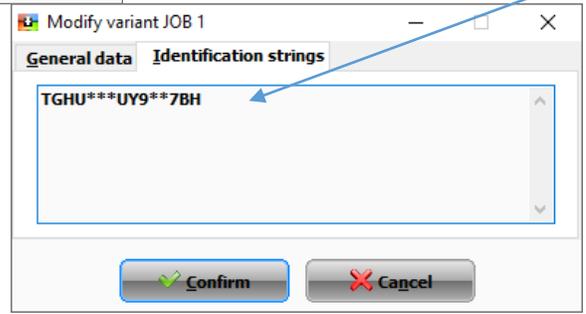


Image link to the variant

VIN format. It is possible to use the following special characters:

- ? all characters
- # only digits
- ! only letters
- * any string with any length

Examples:
 ABC?? → accepts ABCT5, AAA88
 ##!! → accepts 56ER, 99AA, 13WE
 AB*12 → accepts AB284TRW5434512, AB12, ABG12
 *AB*12 → accepts USFH34ABYWWRG8734312

Operations Link to the Model/variant

Identifier	Description
Break system	4 screw at 20 Nm

Points nr. 4

Nominal torque: 20.00 Nm Must be reached

Class: 10% (±10%) +

Minimum torque: 18.00 Maximum torque: 22.00

Threshold: 10.00

Nominal angle: 5.00 ° Must be reached

Class: (None) +

Minimum angle: 3.00 Maximum angle: 99.00

Allow manual results input Show the error popup to the operator

Trace after results: Never

Hide points on pictures



3. How to manage the Update of all stations

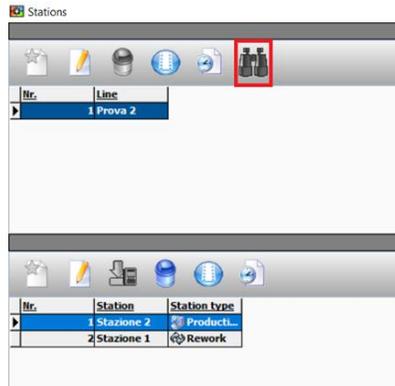
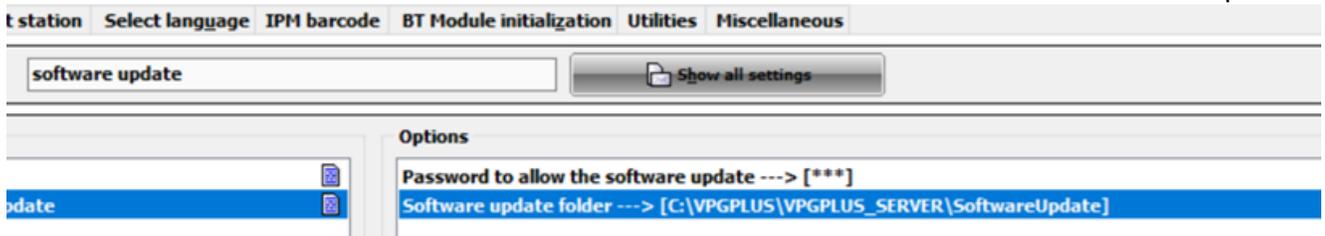
Manage the update of all your stations are one of the key parts of your Job. Now, how to do it and what are the options to do it

- What are you able to update with VPG+ :
 - Software version of each station
 - VPG+ Configuration of each station
- When : Manually or at a dedicated time
- Versioning management : Yes, if you take the option, we can manage the versioning of each operation with the date/time/user who change each parameter

Operations		
	00008 - Ver. 1	00008 - Ver. 2
	Abschirmblech Rädertrieb 06R	Abschirmblech Rädertrieb 06R
Operation data		
Operation ID		
Torque	Nm	Nm
Nominal torque	5 Nm	6 Nm
Minimum torque	3	6
Maximum torque	7	6,6
Threshold	2,5	3
Nominal angle	30 °	30 °
Minimum angle	0	0

Versioning management

VPG+ Software update



Update Station database One per one Or globally

Stations monitoring							
		Online stations (6)		Offline stations (2)			
Line	Station	Version	Central DB	Host name	VIN	Progress	% RESERVE
LINE 01	STATION	2.6.5.4	Yes	GIANFRANCO-VH - 10.0.2.15		0/0	0
LINE 02	STATION 01 [1]	2.6.5.4	No	GIANFRANCO-VH - 10.0.2.15		0/0	0
LINE 02	STATION 02 [2]	2.6.5.4	No	GIANFRANCO-VH - 10.0.2.15		0/0	0
LINE 02	STATION 03 [5]	2.6.5.4	No	GIANFRANCO-VH - 10.0.2.15		0/0	0
LINE 02	STATION 04 [4]	2.6.5.4	No	GIANFRANCO-VH - 10.0.2.15		0/0	0
LINE 02	STATION 06 [3]	2.6.5.4	No	GIANFRANCO-VH - 10.0.2.15		0/0	0





4. Communication protocol with customer Database

software like MES, PLC, Data

Coming soon



5. Accessories management

1. Positioning system, geolocation, socket tray, etc





6. Alarm management

Error code management : When inside a station or the production line you have an error, like

The screenshot shows the SQnet + Collector software interface. It features a menu bar with options like 'Quality control results', 'Production results', 'Search VIN', 'Global curves composition', and 'Saved curves and compositions'. Below the menu is a toolbar with various icons. The main area contains several filter fields: 'Folder' (set to '(All)'), 'Location' (set to 'Location'), 'Status filter' (set to '(All)'), 'Last check' (with dates 08/06/2015 and 14/06/2015), 'Next check' (with dates 15/06/2015 and 21/06/2015), and 'Test type' (set to 'Any kind'). A table below these filters displays test results with columns: Sel., Location, Po..., Description, Tool, Folder, Test..., Status, Measure, Parame..., Check status, Last check, and Next check. The first row shows a test at location CLI 2134 with a status of '?'.

The screenshot shows an 'Error codes' dialog box with a table listing error codes and their descriptions:

Error	Text
ERR001	Tool disconnected during the test
ERR002	Test executed on the wrong transducer
ERR003	Test aborted by the operator
ERR004	Tool not ready for the test
ERR005	Control instrument bad settings
ERR006	Test program error

The screenshot shows a test configuration window for 'Location: CLI 2134 <0001> CLI 2134'. It includes a table with columns: 'Nominal', 'Tol. limits', 'Contr. limits', and 'Surv. lim'. Below the table, there are sections for 'VIN' and 'Error Code'. The 'Error Code' section has a dropdown menu open, showing a list of error codes with checkboxes. The 'Test aborted by the operator' option is selected.

Cogdion	Values	Operator	Other	Nominal	Tol. limits	Contr. limits	Surv. lim
				20	18 - 22	19,132 - 20,868	19,421 -

Other

VIN

Error Code

- No Error
- Tool disconnected during the test
- Test executed on the wrong transducer
- Test aborted by the operator
- Tool not ready for the test
- Control instrument bad settings
- Test program error

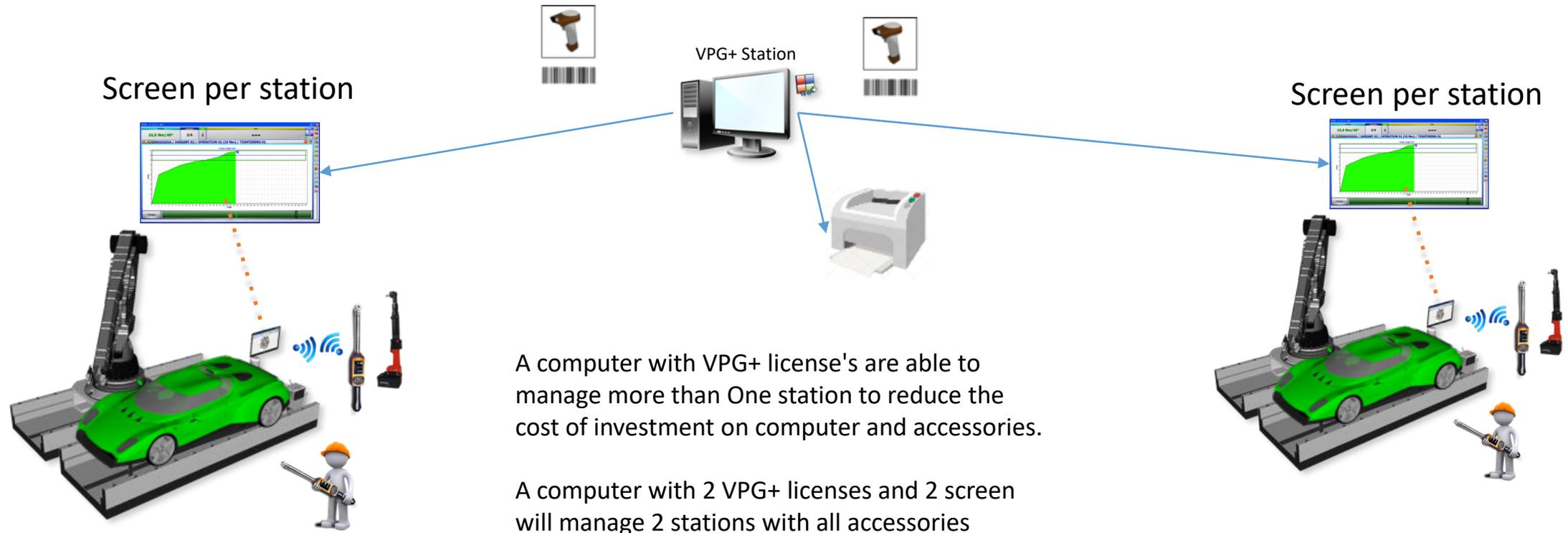
Measure: Torque

Readings	Result	Date
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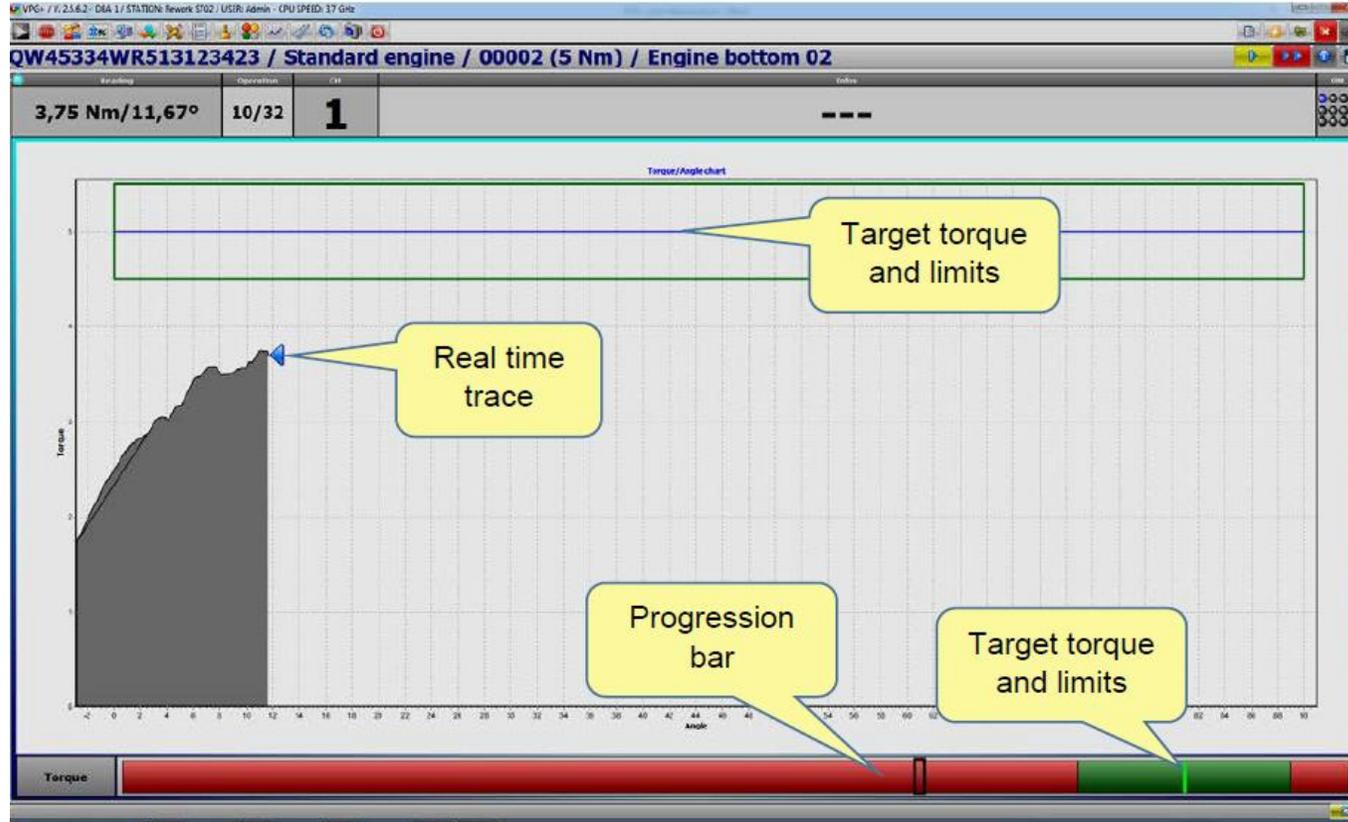
7. Multi License solutions

Manage 2 stations with one computer with 2 screen and 2 VPG+ licenses, manage external large screen , etc



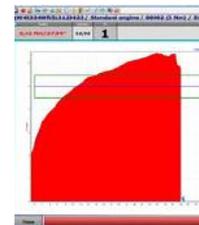
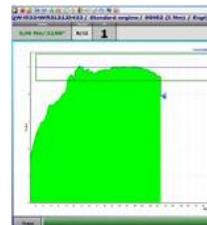
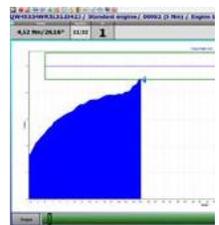


8. Live Trace



With this option, the operator can see the trace in real time on the computer screen and stop to tight when the trace change from Blue to Green.

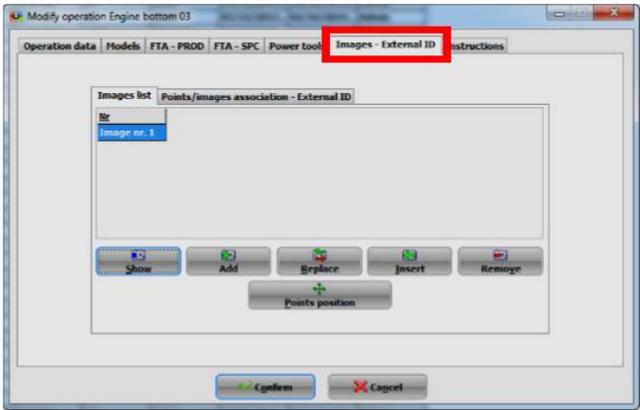
This is really helpful to be able to use a large screen to understand how and when the target value is reach.



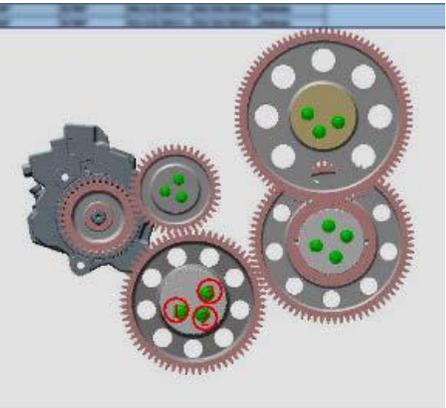
9. Manual Operation inside the Variant

Sometime, you need to add some operation without any power tools, just to add a step on the process and use the operator validation to justify that the job is done. VPG+ is able to manage it and link it on the Model/variant

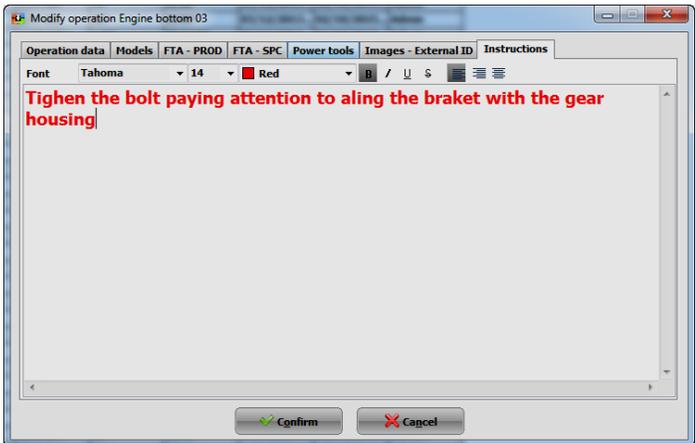
Images – External ID:



Add an operation



Add a picture if needed



Add the instruction for the operator



10. Automatic XML report

After each tightening we can send to a specified folder a customized xml frame to store all data

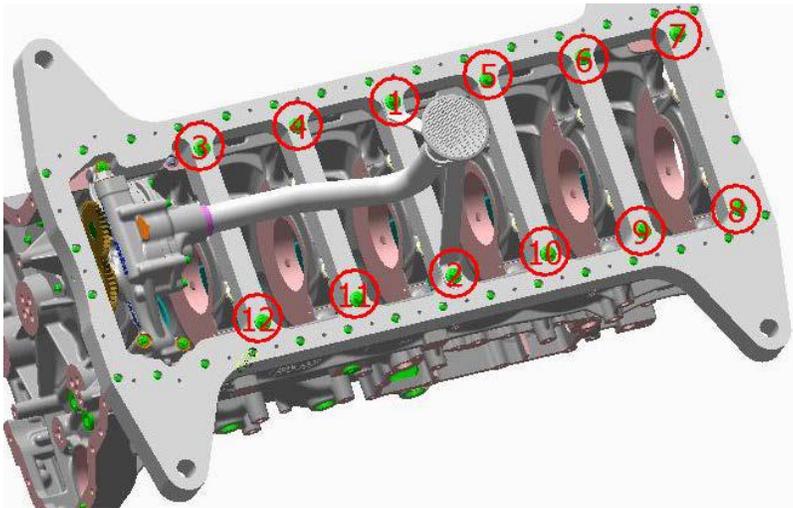
```
<?xml version="1.0" encoding="ISO-8859-1"?>
<Info Type="CycleStopped">
  <Parameters Result="1" Completed="1" CycleStopDT="2015-12-23 13:33:50" CycleStartDT="2015-12-23
  13:32:09" SequenceType="2" SequenceName="01_Fix engine" VariantName="Standard engine"
  VINCode="151" VIN="345TGRGERS34W44"/>
  - <Operations>
    <Operation AddSPCRes5="0" HasSPCRes5="0" AddSPCRes4="0" HasSPCRes4="0" AddSPCRes3="0"
    HasSPCRes3="0" AddSPCRes2="0" HasSPCRes2="0" AddSPCRes1="0" HasSPCRes1="0" AddRes5="0"
    HasRes5="0" AddRes4="0" HasRes4="0" AddRes3="0" HasRes3="0" AddRes2="0" HasRes2="0"
    AddRes1="0" HasRes1="0" SPCResultDT="1899123000000" SPCStatus="-1" SPCAddResults=""
    SPCAnglePeak="0" SPCTorquePeak="0" SPCAngle="0" SPCTorque="0" SPCMethod="0"
    SPCMaxTorque="0" SPCMinTorque="0" SPCNomTorque="0" OperatorCode="Admin" ToolSN="BARCODE
    READER" Crv="" HasCurveSPC="0" HasCurve="0" ToIgnore="1" Locked="1"
    NewResultDT="20151223133306" LastResultDT="20151223133209" ErrorCode="0"
    CycleResultsCounter="2" GlobalResultsCounter="2" AlreadyTightenedFlag="0" Status="1" OverallOK="1"
    Value2OK="1" Value1OK="1" BarCode="1111aa" Value2="0" Value1="0" MaxRetries="0" PrgNr="0"
    ToolNr="1" TOSNr="0" AllowManualResultsInput="0" LogicalOperationOnlyDoneButton="0"
    BarCodeMask="111*AA" MaxValue2="0" MinValue2="0" MUIId2="0" NomValue2="0" Threshold="0"
    MaxValue1="0" MinValue1="0" MUIId1="40" NomValue1="0" ControlMethod="4" OperationType="1"
    NrOfPoints="1" PointNr="1" OperationInstructions="{\rtf1\ansi\ansicpg1252\deff0\deflang1040
    {\fonttbl{\f0\fnil\charset0 Tahoma;}} {\colortbl ;\red0\green255\blue255;\red0\green0
    \blue0;}\viewkind4\uc1\pard\cf1\b\f0\fs24 Scan VIN on the side of the part\cf2\fs16
    \par }" OperationDescription="Scan VIN" OperationIdentifier="BB01"/>
    <Operation AddSPCRes5="0" HasSPCRes5="0" AddSPCRes4="0" HasSPCRes4="0" AddSPCRes3="0"
    HasSPCRes3="0" AddSPCRes2="0" HasSPCRes2="0" AddSPCRes1="0" HasSPCRes1="0" AddRes5="0"
    HasRes5="0" AddRes4="0" HasRes4="0" AddRes3="0" HasRes3="0" AddRes2="0" HasRes2="0"
    AddRes1="0" HasRes1="0" SPCResultDT="1899123000000" SPCStatus="-1" SPCAddResults=""
```



11. acknowledge fault management

In VPG+, after a Not OK result the tightening operation must be repeated.

If one Tightening is Not OK, one (or more) other tightening must be repeated:



KO relations

Source operation

Identifier	Description	Reference point
00002	Engine bottom 02	Any point
		1
		2
		3
		4

Operation/points to invalidate on KO status

Identifier Description With relations

Identifier	Description	All points	1	2	3	4	5	6	7	8	9	10	11	12	13
00002	Engine bottom 02		•												
00001	Engine bottom 01														
00003	Engine bottom 03														
00004	Engine bottom 04														
00005	Engine bottom 05														
00006	Engine top 01														
00007	Engine top 02														
00008	Engine top 03														
00009	Engine top 04														
00010	Pump 01														

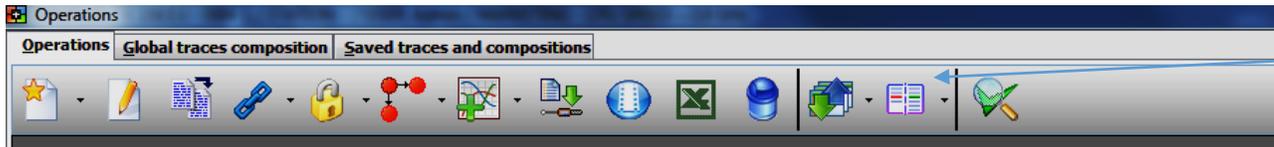
Set default columns width

Confirm Cancel



12. Operations Comaprisons

SCS exclusivity, with this function, you can compare the operation and analyze the problem.



Compare operation

	00016	00017	00018
	Gear 03	Gear 04	Gear 05
Operation data			
Torque	Nm	Nm	Nm
Nominal torque	12 Nm	11 Nm	10 Nm
Minimum torque	8	8	9,5
Maximum torque	12	12	10,5
Threshold	6	5,5	5
Nominal angle	30 °	30 °	30 °
Minimum angle	0	24	0
Maximum angle	90	36	90
Instructions			
FTA - PROD			
Tightening type	Torque with angle monitoring	Torque + Angle	Torque with angle monitoring
Min angle to min torque	0 °	0 °	0 °
Min load	0 Nm	0 Nm	0 Nm
Short timeout torque	0 Nm	0 Nm	0 Nm
Short timeout angle	0 °	0 °	0 °
Untighten torque	0 Nm	0 Nm	0 Nm
Untighten angle	0 °	0 °	0 °
Start opening	0 Nm	0 Nm	0 Nm
Open change of direction	0 %	0 %	0 %
Long timeout	4000 ms	4000 ms	4000 ms
Short timeout	200 ms	200 ms	200 ms
Torque correction factor	0	0	0
Socket elongation	0 mm	0 mm	0 mm
Angle correction factor	0	0	0
Flavin correction factor	0 °/Nm	0 °/Nm	0 °/Nm

In red, the difference with the other operations





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