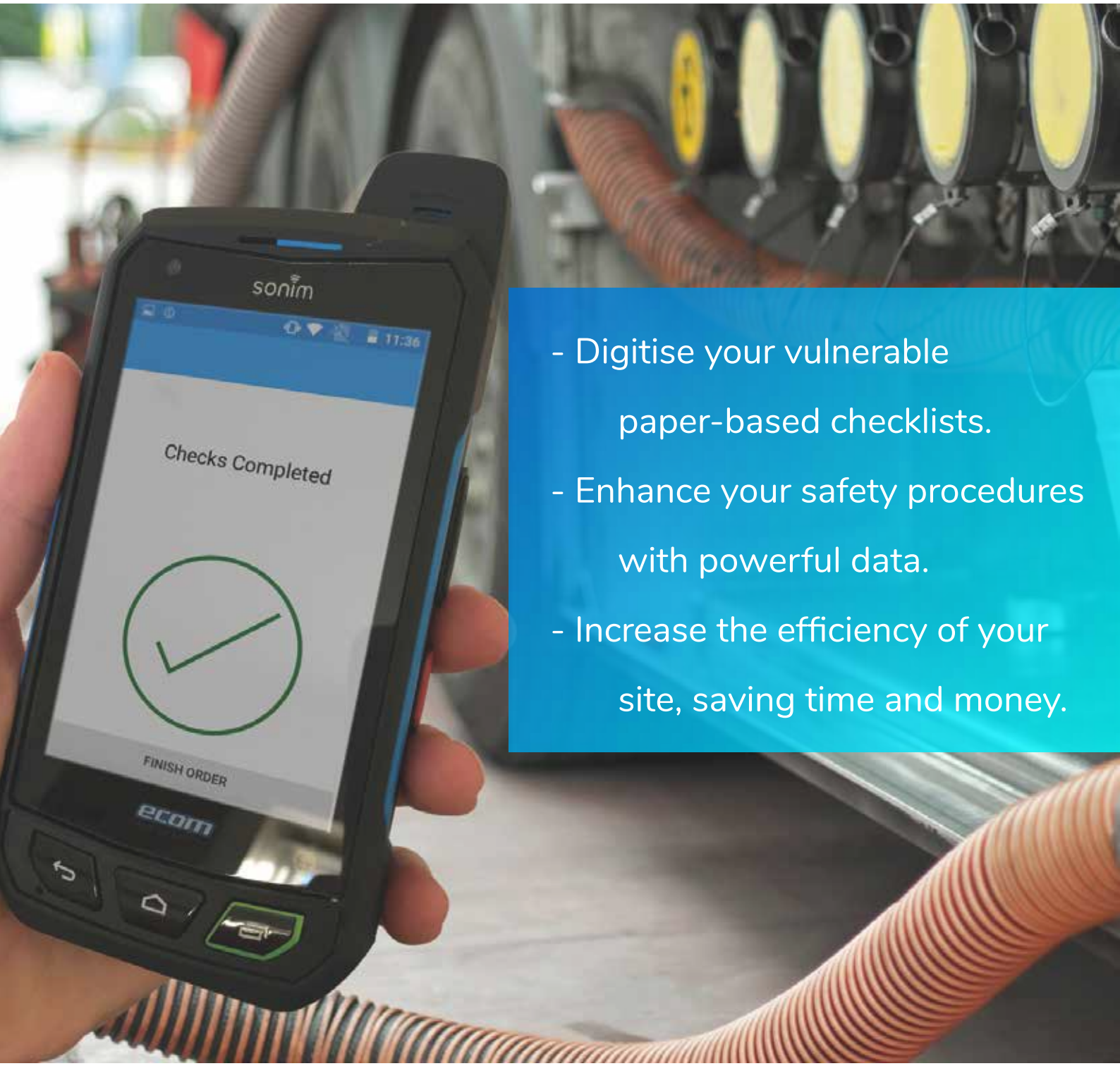
# MHT Technology Ltd

Digital Transformation with Human Design




- Digitise your vulnerable paper-based checklists.
- Enhance your safety procedures with powerful data.
- Increase the efficiency of your site, saving time and money.

# CheckScheme

Eliminate paper-based checklists

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# The risks of using paper-based checklists

### 1. Inefficiency
Paper-based checklists can be easily misplaced, taking valuable time away from areas of your business you could be focusing on.

### 2. No data mining
A paper-based checklist lacks the ability to track and harness important data that can be used to identify crucial improvements in your operations.

### 3. No control
How can you be sure that operators are using the latest protocols? Designing a new hardcopy process is much more difficult to implement, whereas changes in Safe Ops are instantly applied.

### 4. No certified record
There is no proof that checklists were done at the time specified on a paper checklist. In the event of an incident, HSE favours digital records.

### 5. No physical element
The Safe Ops solution allows RFID tags to be attached to machinery and equipment for the operator to physically scan, proving they have followed the correct checklists.

### 6. Human errors
Paper-based checklists are prone to human error. Checks could be missed or the wrong product could be shipped, resulting in fines and other damages to your business.

CheckScheme provides a simple solution to these risks.

It replaces vulnerable paper-based systems with a centralised way of managing the important checklists that operators carry out in hazardous environments.

Our mission is to eliminate paper-based checks.

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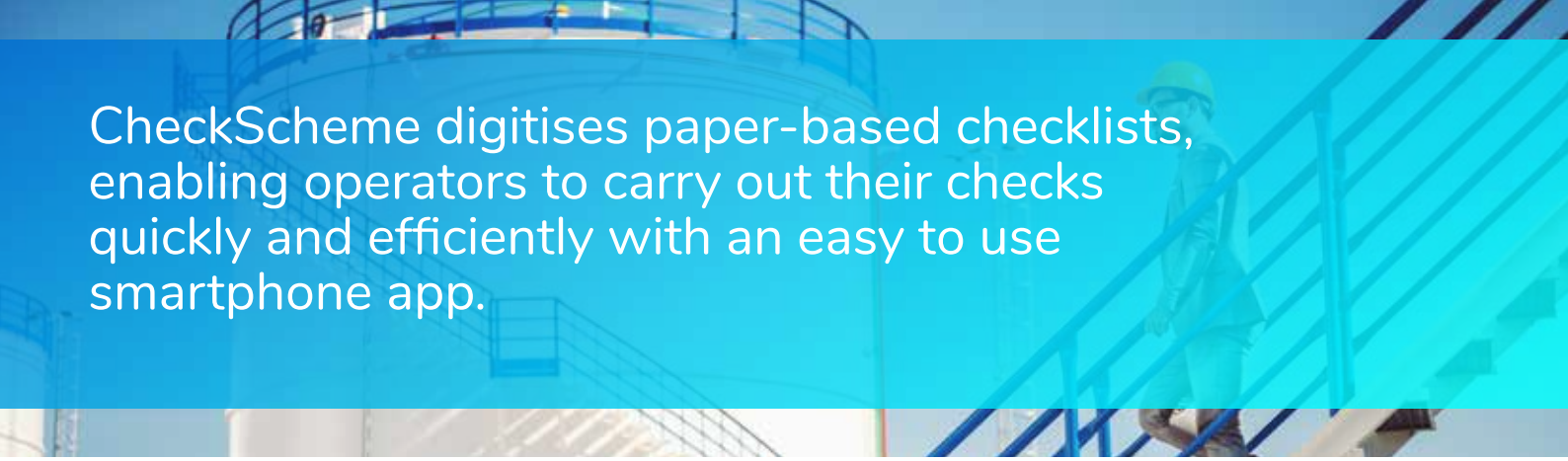

CheckScheme digitises paper-based checklists, enabling operators to carry out their checks quickly and efficiently with an easy to use smartphone app.

# Key Features

## Human Factor

The human factor is at the core of CheckScheme's design, allowing the system to be built around the needs and patterns of the operators.

## Security

PIN access, encrypted data, and the ability to lock phones if they fail to regularly synchronise with the server.

## QR Codes

Operators can verify they are at the right site location by scanning a QR code on signage around the terminal.

## RFID Tags

RFID tags can be attached to plant equipment which can be scanned to ensure the operator is connecting the right loading arm, or opening the correct valve.

## App

MHT's app for ATEX certified Android smartphones gives clear and instant feedback to the operator.

## Gamification

The operator's interest is maintained by the gamification of checking order details.

## Integration

Safe Ops can be easily integrated with your existing software systems.

## Operational Insight

Harness valuable data. Learn from the collected data to improve processes and increase efficiency.

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## Benefits of CheckScheme

CheckScheme raises your operational standards in every aspect of its design. MHT's app for ATEX certified Android smartphones gives clear and instant feedback to the operator, displaying a green icon for successfully completed checks and a red icon to highlight any errors made, providing the ability to instantly correct the mistake before the next stage.

Operators can verify they are at the right site location by scanning a QR code on signage around the terminal. Individual pieces of plant equipment can be identified by attaching RFID tags to them, operators scan the tags to ensure they are connecting the right loading arm or opening the correct valve.

Operators' interest is maintained by gamification of checking order details. For example, a random list of customers is presented and the one relating to the order must be selected. For added safety, ATEX hazardous area Zone 1 certified physical controllers can be optionally integrated to act as permissives.

The operator simply presents the smartphone with a successfully completed series of checks to a controller to activate a pump, open a valve, or release a locked gate.

The smartphone app features several security considerations including PIN access, the ability to lock phones if they fail to synchronise with the server regularly, and encryption of data between the phone and server.

CheckScheme makes your data more meaningful. It provides managers with the ability to mine data from an audit trail to analyse day-to-day operations, red-flagging vulnerable areas so they can target improvements on the most error-prone or most used procedures. Find the cause of safety issues with instant analytics from your checklists.

Say "goodbye" to handwritten, unreliable and misplaced paper-based checklists.

## It's time to advance your operations with the power of digital transformation.


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## CheckScheme in Action

The CheckScheme solution includes a server which can either be deployed in the cloud or your own premises. Operation managers access the server using a web browser, and from there can configure and manage the site's check schemes.

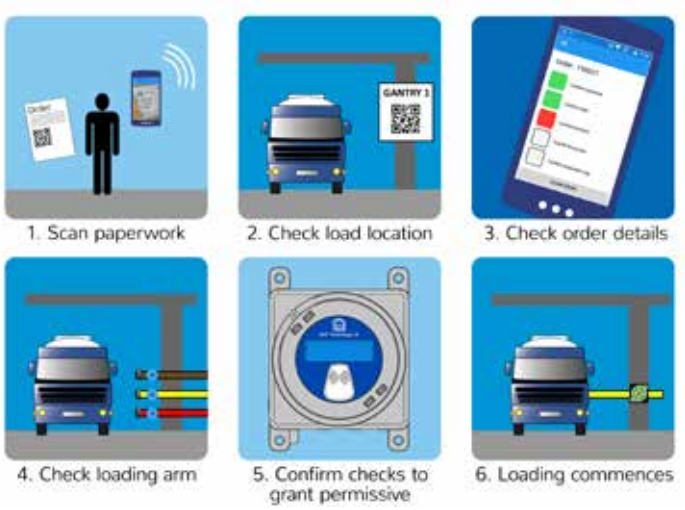
The CheckScheme app is installed on Android mobile devices, which are registered with the server over a Wi-Fi network. The Wi-Fi network does not need to cover the whole site, as the system is designed so that operations can be carried out without any immediate contact with the server.

When the phone is within range of the Wi-Fi network, it synchronises with the server, allowing the latest versions of the check schemes to be downloaded to the phone, and the activities the phone has performed to be uploaded to the server.

By installing the Wi-Fi access point in the staff canteen, the operators can hand in their checklists and can even receive changes to procedures while enjoying their morning cup of coffee.


*Server connecting while the operator has a break*

## Example of a Loading Operation




1. The operator begins by scanning a QR code printed on the works order.
2. The QR code is generated by either filling in a form on the server or by integrating Safe Ops with company ERP systems via an API on the server.
3. The QR code identifies the check scheme to use, a reference number for the activity and the expected values the operator will give.
4. The operator steps through the checks one-by-one. An incorrect response prompts the operator to try again, while correct responses confirm that the operator is at the right loading bay or using the right loading arm.
5. When the final check is completed successfully, the operator is given a clear message.
6. If a physical controller is being used, the smartphone is presented to the SOC controller and a permissive relay is closed allowing the machinery to be activated.

## Are you interested to find out more?

With the aid of CheckScheme, operations can be controlled, measured, and safer: reducing the level of risks with human factors associated with product loading and discharging processes.

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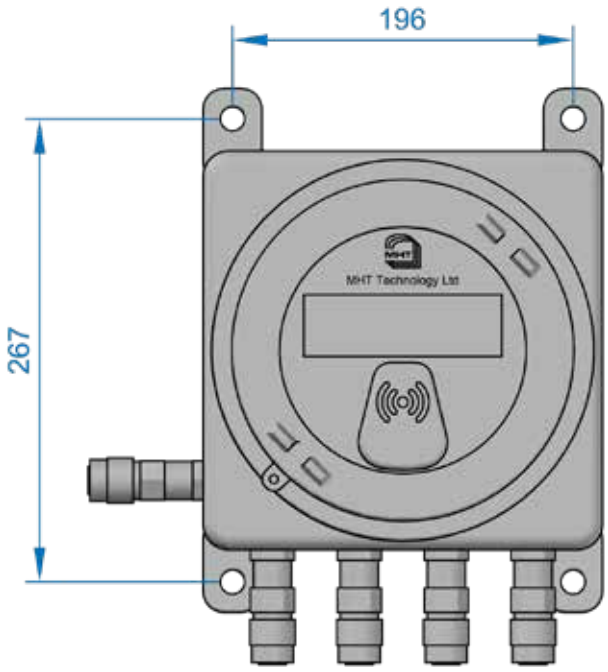
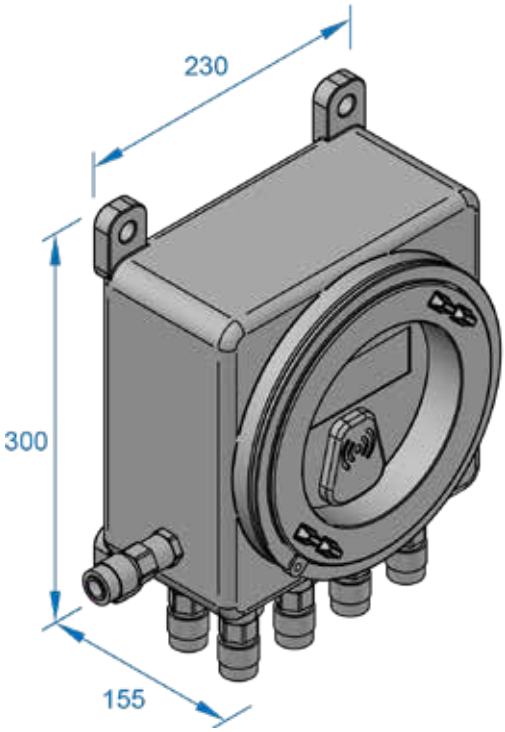
# Physical Controller

The SOC (Safe Operation Controller) is an optional physical component of the CheckScheme system. Once all the scanning steps are correct, internal switches provide a permissive signal to start a pump or open a valve, depending upon the system configuration.




## Technical specifications

| | |
|---|---|
| **Power:** | 100-240 Vac<br>50-60 Hz<br>25 VA<br>0.375 A max |
| **Certification:** | ATEX II 2 G D Ex db IIC T6 |
| **Environment:** | Hazardous area Zone 1 |
| **Operating temperature:** | -20 °C to +55 °C |
| **Storage temperature:** | -40 °C to +85 °C |
| **Enclosure:** | Aluminium alloy<br>Painted RAL 7035 grey epoxy |

| | |
|---|---|
| **IP rating:** | IP66 |
| **Entries:** | M20 (x 9) threaded entries |
| **Terminations:** | Screw terminals, 2.5 mm² capacity |
| **External dimensions:** | 300 x 230 x 155 mm |
| **Fixings:** | To suit M12 bolts, four positions |
| **Weight:** | 7.5 kg |
| **Display:** | Multi-line text/graphics LCD with backlight |
| **Internal relays:** | 8 |

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## Managing processes

The data uploaded to the server includes a timestamped log of events that have occurred while using the app, including any incorrect responses the operator has given. Supervisors can examine the handling of a specific order to confirm issues regarding any delays in completing the procedure. They can also report statistics for the performance of processes.

Check schemes are subject to a workflow within the system. This gives the operations manager the ability to create a new check scheme, test it, then get it approved for use and retire old schemes at the end of their life.

Paper-based systems, while being cheap to implement, are difficult to change and maintain. This leads to a reluctance to improve procedures, resulting in missed opportunities for safer and more efficient working.

## Benefits

- Ability to harness data and improve procedures.
- Reduce costs associated with misplaced files and save time from handwritten checklists.
- Accurate and more reliable evidence that procedures have been followed correctly in the event of an accident.
- Involve and motivate your team more to successfully complete their process.

### Let's Talk

We can arrange a demonstration of how CheckScheme works and how it could benefit your site operations.

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CheckScheme is an outstanding digital solution. Not only because of how the algorithm and potential technology behind it has been maximised but also because of how the human factor has been at the core of the solution right from the beginning. When it comes to digitalisation, there is a great tendency to consider only data and technology, but MHT strongly believes the human element is of equal importance.

With the aid of CheckScheme, operators can make the handling of hazardous materials such as petrochemicals, fuels, and chemicals, controlled, measured and safer, reducing the human element of risk associated with product loading and discharging processes.

All of these benefits can be provided without investing in expensive automation projects that have the potential to disrupt operations and increase maintenance costs.

*QR codes in use at a site*