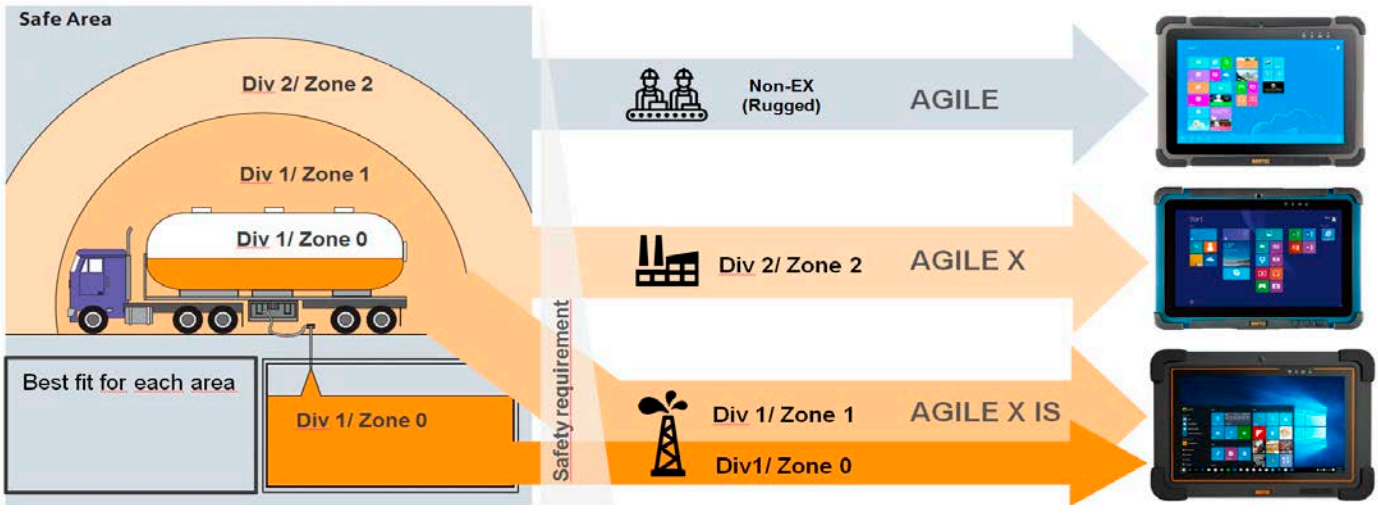
Enterprise mobility meets classic automation: portable HMIs in the process industry

An integrated approach to automation, which must include potentially explosive atmospheres, is needed in order to successfully go down the smart factory path.
BARTEC offers mobility solutions such as tablet PCs, touch screen computers, scanners and corresponding infrastructure equipment to create a portable form of classic HMI solutions. Manufacturers already supply a range of apps for remote access to control systems and controls. For which application scenarios do portable HMIs make sense, and what benefits can be gained from them?

Companies require three components for classic HMI to be available throughout all potentially explosive areas:

1. Software, to monitor, maintain and operate machinery and plant directly on site. All well-known manufacturers now offer suitable solutions – from SIEMENS and Pro-face to Rockwell Automation.

2. Mobile hardware solutions for Zone 1, Zone 2 and non-hazardous areas. For years BARTEC has positioned itself as solution and system providers in this area, among other things with the integrated Agile X tablet PC solution.



Agile Tablet PC system solution. Consistency from non-EX to zone 0

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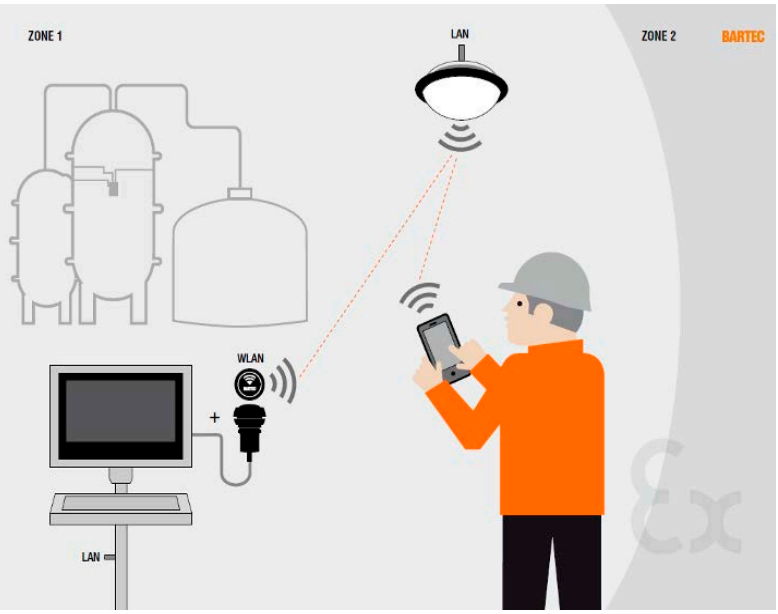
BARTEC Enterprise Mobility Portfolio Overview

3. Infrastructure and accessories. Wi-Fi access points, barcode and RFID scanners with Bluetooth support for the efficient connection to mobile and stationary HMIs are likewise all available from BARTEC. Using these tried and tested components, a range of modern automation scenarios can be achieved to boost the efficiency of operations, reduce investment and maintenance costs and increase process reliability:



Scenario 1

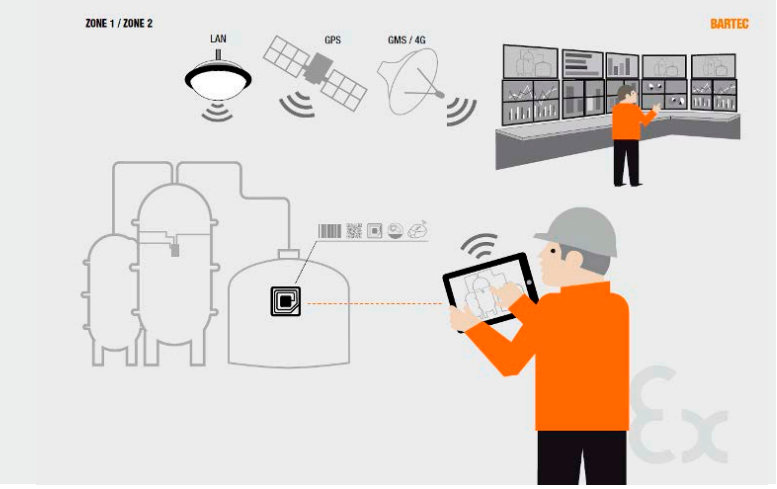
Scenario 1: mobile plant monitoring

"Mobile or stationary" is not an either/or question. In places where work is frequently carried out on the process, a large, individually equipped HMI will certainly be the first choice. This will be situated either in Zone 1 or 2. The systems can also be controlled by mobile devices using available apps such as Pro-face Remote HMI or Simatic WinCC OA OPERATOR.

This enables those responsible for keeping track of the current status of their plant at any time wherever they are. What is more, the system can assume the previously manual task of service monitoring. In addition to the BARTEC Agile X tablet PC platform, the Impact X smartphone (Zone 1) or Lumen X 4 touch screen computer (Zone 2) are suitable as mobile hardware for potentially explosive atmospheres.

Scenario 2:
purely mobile machine operation

Alternatively machine operation may be exclusively mobile. This makes sense wherever machinery and plant are typically configured once, and then only rarely adjusted, as is the case with pump control systems for example. The BARTEC Agile X tablet PC system offers various Windows operating systems for this, for example Windows 10 IoT. The application software is then installed directly on the mobile device. The tablet PC replaces the stationary HMI.



Scenario 2

Thanks to the portability, several terminals can be consolidated and production sequences with a number of successive procedures can be monitored and controlled using just one tablet PC, such as for the mixing and filling of containers or for the intensive monitoring involved in producing tablets. Individual plant and machinery are identified by an integrated barcode or RFID scanner. One example: the tablet reports an error on machine 3. The member of staff goes there, logs in by RFID tag and rectifies the error or initiates further steps.
If wished, the tablet in conjunction with a docking station can become a complete PC substitute and mobile office, among other things enabling important documents such as circuit diagrams or maintenance plans to be taken into the potentially explosive atmosphere.

Device selection: operating system and screen size

The choice of the operating system for mobile HMIs depends on the application scenario in question. For classic visualisation tasks and classic PC applications, we recommend the BARTEC Agile X with Windows OS and 10-inch screen. Solutions that will operate across zones, such as the Agile X tablet PC platform are particularly advantageous in terms of cost, operation and maintenance because they have a uniform layout and there is only one IT system to maintain.

Apps for the supplementary remote access are usually based on Android. BARTEC has developed the handy LUMEN X7 7” industrial tablet for use in Zone 2, while the Impact X smartphone can also be used in Zone 1.

Wireless: Wi-Fi infrastructure and Bluetooth scanners

As a system provider, BARTEC also impresses with supplementary solutions with which chemicals and pharmaceuticals companies can take their standard HMI applications into potentially explosive atmospheres. These include the innovative Wireless X Wi-Fi access point developed for Zone 1 or the BCS Bluetooth scanner developed jointly with Zebra which is available across zones. The latter represent a cost-efficient solution, for example when using 2-D barcodes and scales to transmit the correct amount of the right ingredient to the HMI, thereby boosting process and documentation reliability.

Stationary 7” HMIs with open operating system

This benefit can also be achieved using small stationary HMIs such as the POLARIS SMART HMI 7“ W. With the optional Smart Device Module it is possible to integrate the device into the Wi-Fi or pair it with a Bluetooth scanner. This creates a cost-efficient alternative to classic mobile computers because the application runs directly on the HMI. An optional external keyboard is also available for frequent data input. Here is a typical use scenario: production data or material withdrawals are captured via the scanner in Zone 1 and transferred directly from the HMI to the control system.
Feedback signals are alternatively possible with an HMI in Zone 2 that receives its data from a Bluetooth scanner in a fixed position in Zone 1. Existing plants can be retrofitted quickly and cost-efficiently using the BARTEC BCS handheld scanner..

HMI system in Zone 1 with Bluetooth scanner series BCS3678-IS (Zone1) and connection to the network via Wireless X AP.

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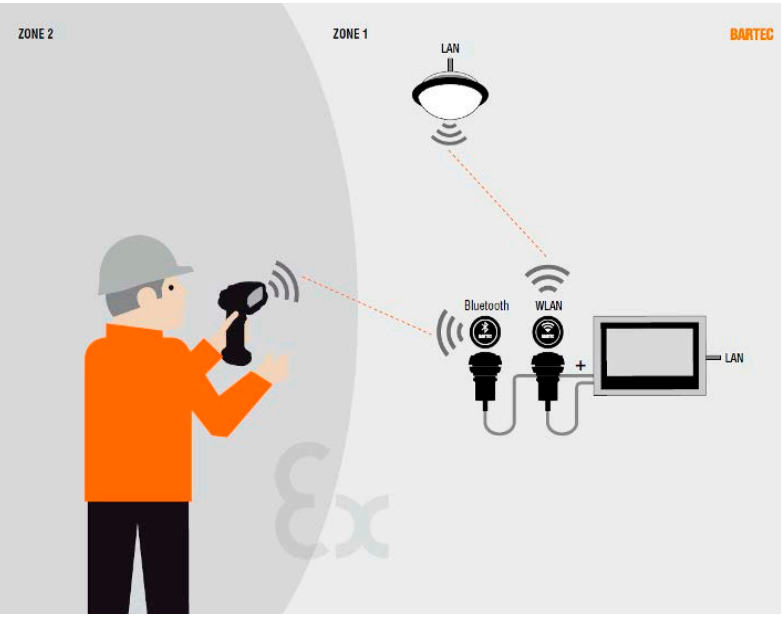
Conclusion: now is the time to act

There is a clear trend: with a view to integrated automation, stationary equipment is increasingly fusing with mobile solutions. Thanks to the diverse app support from machine and plant manufacturers and the broad hardware portfolio from BARTEC, it is possible to transfer potentially explosive atmospheres to a uniform automation strategy as required and, with an ideal cost/benefit ratio, achieve sustainable efficiency gains.



HMI system in Zone 1 with Bluetooth scanner series BCS3678-NI (Zone 2) and connection to the network via Wireless X AP

BARTEC as system provider:

With its broad portfolio, BARTEC is ideally positioned for integrated HMI strategies:

- Broad portfolio of mobile devices for potentially explosive and non-hazardous areas: smartphones, tablets and tablet PCs
- Different operating systems for manufacturer apps, e.g. SIMATIC WinCC Runtime Advanced
- Classic remote access solutions for process systems (KVM and Zero Client)
- Screen sizes from 7” to 24” Zone 1/ 21 and Zone
- Wireless X Wi-Fi access point

Example of scenario 1: mobile plant monitoring
SIEMENS WinCC OA OPERATOR on Tablet PC Agile X and HMI POLARIS SMART 7“

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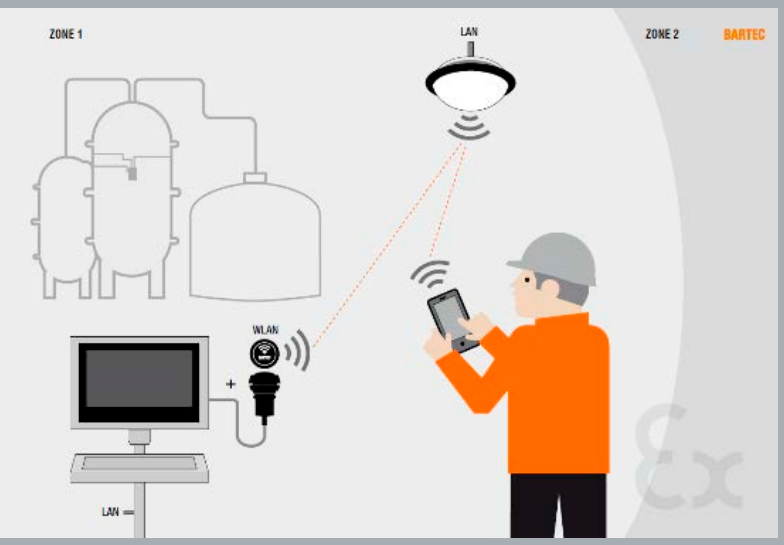
The initial situation:

- None or insufficient automation in potentially explosive atmospheres
- Lost production due to long or frequent routes to stationary HMI

The challenge:

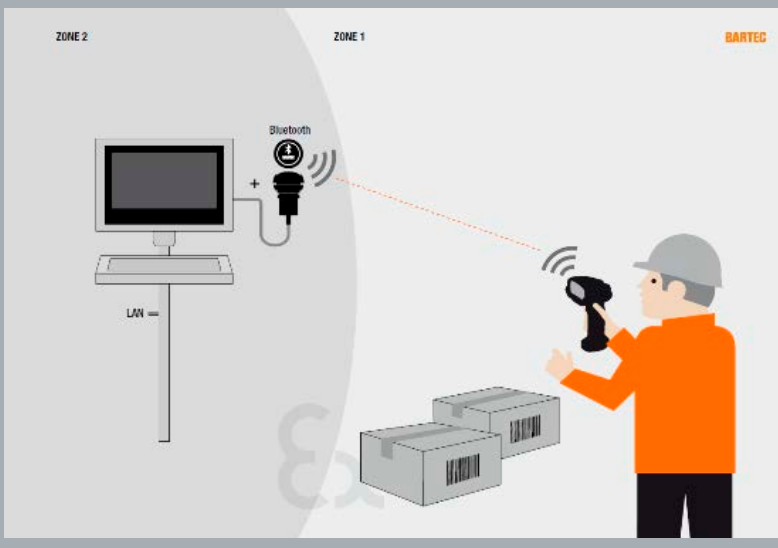
- Development of efficiency potential using appropriate mobile and wireless solutions
- Stringent automation of potentially explosive atmospheres through to the machine (Zone 1)

Use Case 1: remote access to stationary HMI in Zone 1 or 2 using BARTEC Agile X, LUMEN X and Impact X mobile devices



Use Case 2: purely mobile machine operation / replacement of stationary HMIs with BARTEC Agile X mobile devices

Use Case 3: direct messaging in the control system in Zone 1 using the BARTEC POLARIS Smart HMI 7" (stationary) and integrated Bluetooth scanner



Use Case 4: data capture in Zone 1 using the BARTEC BCS Bluetooth scanner, transmission of data to HMI in Zone 2 (also perfect for retrofitting)

The result:

- Appropriate selection of solution due to the broad hardware portfolio of mobile devices, stationary HMIs, scanners and infrastructure components
- Lasting efficiency gains: shorter paths, simplification of work in the field, greater process reliability, automatic documentation