

Robot keeps our heart beating

零件管理機械人

Hactl's drive to improve efficiency through the adoption of tech solutions has taken a further step forward, with the opening of a new Automated Parts Store (APS) for its giant container- and loose cargo handling systems.

Hactl's Container Storage System (CSS) has 11 levels, is 260m long, and stores and retrieves up to 8,000 tonnes per day in a giant racking system that holds 3,500 units. Meanwhile, its Box Storage System (BSS) handles loose cargo, using 10,000 stillages that run on tracks between the cargo pick-up and build-up areas.

These giant machines are the beating heart of Hactl: they work 24/7/365 to maintain Hactl's mission-critical operations, and daily maintenance as well as occasional breakdowns means the 80-strong team of engineers and technicians who care for the machinery are constantly visiting the parts stores to collect the components they need.

The manual parts requisition process required technicians to visit the main parts store in the terminal, and collect components such as sensors, switches and lamps for replacement. The technicians' work takes place around the clock. Outside the parts store's opening times, the technicians could sometimes obtain their needs from a parts cabinet in the Maintenance Services Centre on level 3, but this held only 60 or so of the most commonly-used parts. They recorded their requisitions in a logbook, which the parts store staff then used to update stock levels. The parts store staff also had to conduct a manual inventory cross-check every week, which was a time-consuming task.

香港空運貨站 (Hactl) 開設了全新的「自動化零件補給站」，通過利用先進科技，進一步提升貨站維修其龐大航空貨箱及散貨箱儲存系統的效率。

Hactl 的航空貨箱儲存系統 (Container Storage System) 高 11 層、長 260 米，共有 3,500 個儲存位置，每日平均可儲存及提取多達 8,000 公噸貨物。而貨站的散貨箱儲存系統 (Box Storage System) 則備有 10,000 個儲存位置，連接貨物交收和裝卸區。

這兩座龐大的貨物儲存系統乃超級一號貨站的心臟，它們全天候 24 小時無間斷運作，以維持著貨站的高效處貨服務。一隊由 80 位專業工程師及技術員組成的專責團隊為此系統進行定期保養維修，並在系統出現故障時即時進行修復。因此，工程團隊不時需要前往主零件儲存庫提取合適的零件。

工程人員需要到貨站的主零件儲存庫提取如感應器、開關掣和電燈等零件以作更換。在主零件儲存庫的非開放時段，工程人員便需要跑到存放了 60 種常用零件的三樓維修服務中心提取所需零件。而每次工程人員提取後，亦要在紀錄冊上手寫作登記，以便儲存庫人員更新庫存。而儲存庫人員每週則需親自盤點庫存及補充零件，過程十分耗時。

全新開設的「自動化零件補給站」利用全自動機械人，提存置於站內的 200 多個存放多種常用零件的多間隔儲存箱。

The new APS features an automated robot that manages more than 200 multi-compartment bins, which store the most commonly-used spare parts.

The new way

To facilitate the retrieval of spare parts for the repair and maintenance of Hactl's systems and facilities, reducing order-picking times and improving operational efficiency, the new APS features an automated robot that manages more than 200 multi-compartment bins, which store the most commonly-used spare parts.

On arrival at the APS, technicians simply scan the code for the desired parts, and input the quantities needed, via a user terminal. The robot then takes the shortest route to retrieve and deliver the required parts to the technician waiting at the counter. When parts store personnel need to replenish spare parts stocks in the APS, the robot collects these from the counter, and stores them in the correct location in the racking.

The robot weighs around 270 kg, and can lift up to 40 kg. Although the APS is a "no-man" zone with 24-hour CCTV surveillance coverage, the robot is fitted with intelligent sensors to avoid any collisions with either humans or property. The robot automatically re-charges at its home station whenever it is not being deployed.

嶄新方案

為了讓工程人員能夠隨時提取零件以維修貨站的系統和設備，縮減提取零件時間及提高營運效率，全新開設的「自動化零件補給站」利用全自動機械人，提存置於站內的 200 多個存放多種常用零件的多間隔儲存箱。工程人員只需於用戶終端機輸入所需零件的編號和數量，機械人便會自行規劃以最短路程把所需零件的儲存箱迅速送至補給站櫃台，以待工程人員領取。當要為補給站補充庫存時，儲存庫人員只需將零件放在櫃台，機械人便會將零件正確無誤地放回補給站內的貨架上。

重 270 公斤的機械人能舉起重達 40 公斤的物件。補給站乃「無人地帶」，設有 24 小時閉路電視監察系統，但機械人亦內置智能感應器，以防止與人或任何其他物件碰撞。而當機械人處於備用狀態時，會自動返回其充電站補給能源。

Support from a robot that never sleeps

The new APS system automatically updates stock levels after every pick, and parts store staff regularly top up inventory as necessary. The new APS means a technician can collect any of the 200 most frequently-needed spare parts at any time of day or night, and reduces the time taken by about 50%.

Says Toby Wong, Hactl Senior Manager – Engineering Services: "Minimising downtime is the most important consideration in the daily operation of our automated Cargo Handling System. With the use of the robot at the APS, we expect to save more than 1,500 man-hours per annum. A mobile app to request spare parts direct from any location will also be introduced in due course, to further improve efficiency.

"This is yet another example of Hactl proactively identifying and driving out all inefficiency from its operations, through investment in state-of-the-art solutions."

全天候維修支援

同時，全新的「自動化零件補給站」系統會在每次提存零件後自動更新庫存，以便負責補給站的人員適時補充所需零件，維持庫存。有了這個全新的「自動化零件補給站」，工程人員可以隨時到補給站提取 200 多種常用零件，整個過程的所需時間亦大大縮減一半。

香港空運貨站工程服務高級經理王俊強說：「維持貨站全自動貨物處理系統正常運作是我們的首要任務。我們預計配備機械人的『自動化零件補給站』將為貨站每年節省超過 1,500 個工作時數。我們更將會推出手機應用程式，讓工程人員隨時隨地提取零件。這再一次證明貨站精益求精，積極投資創新科技提升營運效率的決心。」

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Hactl Automated Parts Store Video
Hactl「自動化零件補給站」短片
<https://youtu.be/GANyaavI2ek>