

,QWURGXFWLRQ

+DQGLQJ RI VWHHO FRLOV LV JHQHUDOO\ SHUIRUPHG PDLQO\  
E\ FUDQHV DQG DFFXUDWH DQG TXLFN RSHUDWLRQ LV UHTXLUHG  
\$OWKRXXJK RSHUDWRUV PXVW SRVVHV D KLJK OHYHO RI VNLOO LQ  
RUGHU WR DFKLHYH WKLV FRQVLGHULQJ WKH ORZ ELUWKUDWH DJLQJ  
SRSXODWLRQ RI WKH IXWXUH LW ZLOO EH GLIILFXOW WR VHFXUH  
KXPDQ UHVRXUFHV DQG SDVV RQ WKH UHTXLVLWH VNLOOV WR  
\RXQJHU ZRUNHUV )RU WKLV UHDVRQ DXWRPDWLF FUDQH RSHU  
DWLRQ KDV EHFRPH QHFHVVDU\ DQG LQGLVSHQVDEOH

0DQ\ DXWRPDWLF FRLO KDQGOLQJ RYHUKHDG FUDQHV KDYH  
EHHQ DSSOLHG LQ FRPPHUTLDO RSHUDWLRQV  
WUDQVSRUW YHKLFOHV DQG ORDGLQJ XQORDGLQJ UHVWULFWLRQV DU  
IUHTXHQWO\ DSSOLHG WR WKH YHKLFOH VSHFLILFDWLRQV VWUXF  
WXUH VKDSH HWF LQ RUGHU WR GHVLJQDWH WKH YHKLFOH SRVL  
WLRQ 0RUHRYHU LQ WKH FDVH RI VHPL WUDLOHUV ZKLFK DUH  
ZLGHO\ XVHG LQ WUDQVSRUWDWLRQ WR FXVWRPHUV LQWHUYHQWLRQ  
E\ RSHUDWRUV ZDV QHFHVVDU\ EHFDXVH OLPLWDWLRQV RQ WKH  
VSHFLILFDWLRQV RQ WKH YHKLFOH VLGH ZHUH GLIILFXOW DQG WKLV  
ZDV DQ REVWDFOH WR IXOO DXWRPDWLRQ

,Q RUGHU WR DFKLHYH IXOO DXWRPDWLRQ LQ ZKLFK RSHUDWRU  
LQWHUYHQWLRQ LV QRW QHFHVVDU\ -( /RJLVWLFV LQ MRLQW  
ZRUN ZLWK -)( 7HFKQR 5HVHDFK GHYHORSHG D PHDVXULQJ  
V\VWHP ZKLFK FDQ UHVSRRG IOH[LEO\ WR DOO W\SHV YHKLFOHV  
DQG UHDO]HG D WHFKQRORJ\ ZKLFK HQDEOHV IXOO DXWRPDWLRQ  
RI FRLO ZDUHKRXVHV E\ FRPELQLQJ WKH GHYHORSHG PHDVXU

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vehicles that have entered the warehouse and determines the coordinates of the coils on the vehicle was developed. The main specifications of this system are shown in **Table 2**.

In this system)io n town

op\_s s ofs%le(ns nve\_s g detdinveOntiomdeu anpthu maste  
in% s ! r a np,bmb yb a e wa b up cd ` vwa M

-op\_ ar d& r b t m,ll b th d&h b d ' ,lr b

operation by combining this method and a dedicated loading logic which was developed at the same time.

#### 4. Conclusion

This development enabled fully automatic loading and unloading in the warehouse.