

9 L W D P L Q % 9 %

&XUUHQW 5HYLVLRQ DQG 'DWH5HY			
3URGXFW 1DPH	\$WHOOLFDF ,0 9LWDPLQ %	9 %	WHVWV
			WHVWV
\$EEUHYLDWHG 3URGXFW 1DPH\$WHOOLFDF ,0 9%			
7HVW 1DPH ,'		9 %	
6\ VWHPV	\$WHOOLFDF ,0 \$QDO\JHU		
0DWHULDOV 5HTXLUHG EXW 1F\$WHOOLFDF ,0 \$QDO\JHU & \$/ &			sSDFN
			sSDFN
	\$WHOOLFDF ,0 9% '77 5(/		
	\$WHOOLFDF ,0 7 7 9% \$1&		sSDFN
	\$WHOOLFDF ,0 7 7 9% \$1&		sSDFN
2SWLRQDO 0DWHULDOV	\$WHOOLFDF ,0 9% ',/		REF
	\$WHOOLFDF ,0 9% 0&0		REF
6SHFLPHQ 7\SHV	6HUXP ('7\$ SODVPD KHSULQLJHG		SODVPD
6DPSOH 9ROXPH	-/		
0HDVXULQJ ,QWHUYDO	² SJ P/ ² SPRO /		

° \$ YHUWLFDO EDU LQ WKH SDJH PDUJLQ LQGLFDWHV WHFKQLFDO FRQWHG



,QWHQG HG 8VH

7KH \$WHOOLFDF ,0 9LWDPLQ % YLGHQWLYH DQVWLWXWV LHWHRUQ WKH TX
GHWHUPLQDWLRQLRQRYLWV DQG SODVPD ('7\$ DQG KHS
\$WHOOLFDF ,0 \$QDO\JHU

6XPPDU\ DQG ([SODQDWLRQ

9LWDPLQ% F\DQRFREDODPLQ LV D FRPSOH[FRUULQRLG FRPSRXQG
 WKDW VXUURXQG D VLQJPDQV FREDODPLQHYROXPLCH\ IURP DQLPDO
 GLHWDU\ VRXUFHV VXFK DV9EWDWLOHJXLUDQGLQWONLQVLF IDFWRU
 VHFUHWHG E\ WKH SDULHWDO FHOOV LQ WKH DDQWLUQWUPLXFRVFD IR
 IDFWRU IRUP D FRPSOH[WKDW DWWDFKHV WR UHFHSWRUV LQ WKH
 WUDQV FREDODPLQV WUDQVSRWKHWKXFRVDDPLQOV WR WKH EORR
 ORVW YLWDLFLQVWUHG LQ WKH OLYHU DV ZHOODV LQ WKH ERQH PD

9LWDPLDQ% IRODWH DUH FULWLFDO WR QRUPDO '1\$ V\QWKHVLV ZH
 PDWXUDWLVROPLQ% DOVR QHFHVVDU\ IRU P\HOLQ VKHDWKH IRUPDWLR
 ERG\ XVHVWLVWU%V YHU\ HFRQRPLFDQOO\IURPDVWRULELQXYPYDQPLQ %
 UHWXUQLQJ LW WR WKH OLYHU VR WKDW YHU\ OLWWOH LV H[FUHW
 &OLQLFDO DQG ODERUDWRULILHQGLQ%FOIRG%QHXRORJLFDQ DEQRU
 GHFUHDVHG QHYXID% DQG LQFUHDVHG H[FUHWKRQLRSPLHWG OPDOR
 '1\$ V\QWKHVLV DVVRFLDWGHGLZFLWQFYLWDDPLQ%PDFURF\WLF DQHPLDY
 DQHPLDV DUH FKDUDFWHUL]HG E\ DEQRUPDO PDWXUDWLRQ RI HUI\W
 PDUURZ ZKLFK UHVXOWV LQ WKH SUHVHQFH RI PHJDQREODVWV DQ
 VXUYLYDO

3HUQLFLRXV DQHPLD LV D PDFURF\WLGHIQFIPHQFRDXKDWG EV GLXMDW
 RI LQWULQVLF IDFWRUQWBYHLJDDPLQ%WRP\ GLVHDVHV RI WKH VP
 PDODEVRUSWLRQ DQG WUDQV FREDODPLQ GHILFLHQF\ FDQ DOVR I

3ULQFLSOHV RI WKH 3URFHGXUH

7KH \$WHOOLFDF,0 9% DVVD\ LV D FRPSHWLWLYH LPPXQRDVVD\ XV
 WHFKQRORJ\ LQ ZKURPDKPSQWLHQW VDPSON FQPSHOHHY ZLWK Y
 ZLWK DFULGLQLXP HVWHU LQ WKH /LWH 5HDJHQW IRU D OLPLWHG
 ZKLFK LV FRYDOHQWO\ FRXSOHG WR SDUDPDJQHWLF SDUWLFOHV L
 5HOHDVLQJ \$JHQW VRGLXP K\GUR[LGH DQGRP7WWRHGHORJHQRWKH
 ELQGLQJ SURWHLQV LQ WKH VDPSON DQG FRELQDPLGH WR SUHYHG
 DGGHG WR WKH VDPSON

\$Q LQYHUVH UHODWLRQV KLS H[LVWV ESHVZVHHQWLVKH VDRR XQW SDHYD
 WKH DPRXQW RI UHODWLYH OLJKW XQLWV 5/8V GHWHFWHG E\ WK

5HDJHQWV

0DWHULDO 'HVFULSWLRQ	6WRUDJH	6WDELOLW\
\$WHOOLFDF,0 9% 5HDG\3DFNŠ S\QDSUHQHGDMQW8SDVFN H[SLUDWLRQ GDWH RQ /LWH 5HDJHQW		SURGXFW
P/ UHDJHQW SDFN		
\$FULGLQLXP HVWHU ODEHQHG YLWDFLQ% 3QERDUG		GD\
EXIIHU VRGLXP D]LGH	SURWHLQ VWDELOL]HUV	
SUHVHUYDWLYHV		
6ROLG 3KDVH		
P/ UHDJHQW SDFN		
3XULILHG KRJ LQWULQVLF IDFWRU a —J P/ FRYDOHQWO\		
FRXSOHG WR SDUDPDJQHWLF SDUWLFOHV LQ EXIIHU		
FRELQDPLGH SURWHLQ VWDELOL]HUV VRGLXP D]LGH		
SUHVHUYDWLYHV		

0DWHULDO 'HVFULSWLRQ	6WRUDJH	6WDELQOLW\
\$WHOOLF D ,0 9% '77 5HOHDVLQJ \$JHQW	\$WHQW	8QWLO H[SLUDWLRQ GD
'77		SURGXFW
P/ YLDO		
'LWKL RWKUH LWRO a PJ YLDO 2QERDUG		KRXUV
5HOHDVLQJ \$JHQW		
P/ YLDO		
6RGLXP K\GUR[LGH a 1 SRWDVVLXP F\DQLGH		
a PJ YLDO		
\$WHOOLF D ,0 7 7 9% \$1& 5HDG\$3DFN	QFLOODU	8QWLO H[SLUDWLRQ GD
UHDJHQW SDFN		SURGXFW
P/ UHDJHQW SDFN		
1 VRGLXP K\GUR[LGH	2QERDUG	GD\
\$WHOOLF D ,0 9% ',/ 5HDG\3DFN	QRSDQG\UMD	8QWLO H[SLUDWLRQ GD
SDFN		SURGXFW
P/ UHDJHQW SDFN		
%XIIHUG KXP DQ VHUXP DOEXPLQ	2QERDUG	GD\
SUHVHUYDWLYHV		

- D 5HIH6WRUDJH DQG 6WDELQOLW\
- E 5HIH0DWHULDOV 5HTXLUHGXW 1RW 3URYLGHG
- F 5HIH3UHFSDULQJ WKH 5HDJHQWV
- G 5HIH2SWLRQDO 0DWHULDOV

:DUQLQJV DQG 3UHFDXWLRQV

)RUQ YLDOBRQRVWLF XVH
)RU 3URIHVVLQRQDO 8VH

&\$87,21

)HGHUDO 86\$ ODZ UHVWULFWV WKLV GHYLFH WR VDOH E\ RU
 SURIHVVLRQDO

6DIHW\ GDWD VKHHWV 6'6 DYDLODEOH RQ VLPHQV FRP KHD



+ + + :DUQLQJ
 3 3 &DXVHV VHULRXV H\H LUULWDWLRQ &DXVHV VNLQ
 3 3 3 PHWDOV
 3 3 3 :HDU SURWHFWLYH JORYHV SURWHFWLYH FORWKL
 SURWHFWLRQ :DVK KDQGV WKRURXJKO\ DIWHU K
 FDXWLRXVO\ ZLWK ZDWHU IRU VHYHUDO PLQXWHV
 SUHVHQW DQG HDV\ WR GR &RQLQXH ULQVLQJ
 &(17(5 RU GRFRU SK\VLFLDQ \$EVRUE VSLOODJH
 'LVS RVH RI FRQWHQW DQG FRQWDLQHU LQ DFR
 DQG QDWLRQDO UHJXODWLRQV
 &RQWDLQXP K\GUR[LGH LQ \$WHOOLF D ,0 7 7 9
 DQG \$WHOOLF D ,0 9% '77 5HOHDVLQJ \$JHQW



&\$87,21 327(17,\$/ %,2+=\$=5'

&RQWDLQV KXPDP VRXUFH PDWHULDO (DFK GRQDWLRQ RI KXPDP E WHVWHG E\)'\$ DSSURYHG PHWKRGV IRU WKH SUHVHGHFH RI DQWLEF YLUXV W\SH +,9s DQG W\SH +,9s DV ZHOO DV IRU KHSDWLW DQWLERG\ WR KHSDWLWLW & YLUXV +&9 7KH WHVW UHVXOWV ZHU 1R WHVW RIIHUV FRPSOHWH DVVXUDQFH WKDW WKHVH RU RWKHU L PDWHULDO VKRXOG EH KDQGOHG XVLQJ JRRG ODERUDWRU\ SUDFW

&\$87,21

7KLV GHYLFH FRQWDLQV PDWHULDO RI DQLPDO RULJLQ DQG VKRXO WUDQVPLWWHU RI GLVHDVH

&RQWDLQV VRGLXP DJLGH DV D SUHVHUYDWLYH 6RGLXP DJLGH FDO WR IRUP H[SORVLYH PHWDO DJLGHV 2Q GLVSRVDO IOXVK UHGHQV SUHYHQW EXLOGXS RI DJLGHV 'LVSRVDO LQWR GUDLQ V\WHPV PX UHJXODWRU\ UHTXLUHPHQWV

'LVSRVH RI KDJDUGRXV RU ELRORJLFDOO\ FRQWDPDQDWHG PDWHUL LQVWLWXWLRQ 'LVFDUG DOO PDWHULDOV LQ D VDIH DQG DFFHSW SUHYDLOLQJ UHJXODWRU\ UHTXLUHPHQWV

1RWHRU LQIRUPDWLRQ DERXW UHJXODV LQVWLWXWLRQV KHWHRU WR 3URFHGXFWLRQ

6WRUDJH DQG 6WDELOLW\

6WRUH UHGHQWV LQ DQ XSULJKW SRVLWLRQ 3URWHFW WKH SURG 8QRSHQHGH UHGHQWV DUH VWDEOH XQWLO WKH H[SLUDWLRQ GDWH

6WRUH \$WHOolFD ,0 9% '77 5HOHDVLQJ \$JHQW LQ DQ XSULJKW S 5HOHDVLQJ \$JHQW LV VWDEOH XQWLO WKH H[SLUDWLRQ GDWH RQ

6WRUH \$WHOolFD ,0 7 7 9% \$1& LQ DQ XSULJKW SRVLWLRQ \$W XQWLO WKH H[SLUDWLRQ GDWH RQ WKH SURGXFW ZKHQ VWRUHG D

6WRUH \$WHOolFD ,0 9% ',/ LQ DQ XSULJKW SRVLWLRQ 8QRSHQHGH WKH H[SLUDWLRQ GDWH RQ WKH SURGXFW ZKHQ VWRUHG DW 2 f&

'R QRW XVH SURGXFWV EH\RQG WKH H[SLUDWLRQ GDWH SULQWHG

2QERDUG 6WDELOLW\

5HGHQWV DUH VWDEOH RQERDUG WKH V\WHP IRU GD\ 'LVFDU RQERDUG VWDELOLW\ LQWHUYDO 'R QRW XVH SURGXFWV EH\RQG V SURGXFW ODEHOLQJ

\$WHOolFD ,0 9% '77 5HOHDVLQJ \$JHQW LV VWDEOH RQERDUG WK

\$WHOolFD ,0 7 7 9% \$1& LV VWDEOH RQERDUG WKH V\WHP IRU

\$WHOolFD ,0 9% ',/ LV VWDEOH RQERDUG WKH V\WHP IRU GD\

6SHFLPHQ &ROOHFWLRQ DQG +DQGOHQJ

6HUXP DQG SODVPD ('7\$ DQG KHSDULQJHG DUH WKH UHFRPPHQGH

&ROOHFWLQJ WKH 6SHFLPHQ

‡ 2EVHUYH XQLYHUVDO SUHFDXWLRQV ZKHQ FROOHFWLQJ VSHFL DUH FDSDEOH RI WUDQVPLWWLQJ GLVHDVH

‡)ROORZ UHFRPPHQGHG SURFHGXUHV IRU FROOHFWLRQ RI GLDJQ YHQLSXQFWXUH

‡)ROORZ WKH LQVWUXFWLRQV SURYLGHG ZLWK \RXU VSHFLP
SURFHVVVLQJ

‡ \$OORZ EORRG VSHFLPHQV WR FORW FRPSOHWHO\ EHIRUH F

‡ .HHS WXEHV FDSSHG DW DOO WLPHV

6WRULQJ WKH 6SHFLPHQ

‡ 'R QRW XVH VDP SOHV WKDW KDYH EHHQ VWRUHG DW URRP

‡ 7LJKWO\ FDS DQG UHIULJHUDWH VSHFLPHQV DW ² f& LI WK
KRXUV

‡)UHH]H VDP SOHV DW " f& LI WKH VDP SOH LV QRW DVVD\H

‡)UHH]H VDP SOHV RQO\ WLPH DQG PL[WKRURXJKO\ DIWHU
7KH KDQGOLQJ DQG VWRUDJH LQIRUPDWLRQ SURYLGHG KHUH
PDLQWDLQH E\ WKH PDQXIDFWXUHU ,W LV WKH UHVSRQVLEL
DYDLODEOH UHIHUHQFHV DQG RU LWV RZQ VWXGLHV ZKHQ HV
PHHW VSHFLILF QHHGV

7UDQVSRUWLQJ WKH 6SHFLPHQ

3DFNDJH DQG ODEHO VSHFLPHQV IRU VKLSPHQW LQ FRPSOLDQ
LQWHUQDWLRQDO UHJXODWLRQV FRYHULQJ WKH WUDQVSRUW

3UHSDULQJ WKH 6DP SOHV

7KLV DVVD\ UHTXLUHV —/ RI VDP SOH IRU D VLQJOH GHWHU
WKH XQXVDEOH YROXPH LQ WKH VDP SOH FRQWDLQHU RU WKH
SHUIRUPLQJ GXSOLFDFWHV RU RWKHU WHVWV RQ WKH VDPH VD
WKH PLQLXP UHTXLUHG YROXPH UHIHU WR WKH RQOLQH KH
7KH VDP SOH YROXPH UHTXLUHG WR SHUIRUP RQERDUG GLOXW
UHTXLUHG WR SHUIRUP D VLQJOH XGHWLRQV PLQDWLRQ 5HIHU WR
1RWHR QRW XVH VSHFLPHQV ZLWK DSSDUHQW FRQWDPLQDWLR
%HIRUH SODFLQJ VDP SOHV RQ WKH V\WHP HQVXUH WKDW VD
‡ %XEEOHV RU IRDP

‡)LEULQ RU RWKHU SDUWLFXODWH PDWWHU

1RWH HPRYH SDUWLFXODWHV E\ FHQWULIXJDWLRQ DFFRUGLQJ
GHYLFH PDQXIDFWXUHU V UHFRPPHQGDWLRQV

1RWH RU D FRPSOHWH OLWV RI DSSURSULDWH VDP SOH FRQWD

3URFHGXUH

0DWHULDOV 3URYLGHG

7KH IROORZLQJ PDWHULDOV DUH SURYLGHG

&RQWHQWV	1XPEHU RI 7HVWV
5HDG\3DFN SULPDU\ UH DJHQW SDFN FRQWDLQLQJ \$WHOOLFDF,0 9% /L 6ROLG 3KDVH \$WHOOLFDF,0 9% PDVWHU F XCUEY H DQG WHVW GHILQLWLRQ	
5HDG\3DFN SULPDU\ UH DJHQW SDFNV FRQWDLQLQJ \$WHOOLFDF,0 9% 6ROLG 3KDVH \$WHOOLFDF,0 9% PDVWHU F XCUEY H DQG WHVW GHILQLWLRQ	

0DWHULDOV 5HTXLUHG EXW 1RW 3URYLGHG

7KH IROORZLQJ PDWHULDOV DUH UHTXLUHG WR SHUIRUP WKLV DVV

'HVFULSWLRQ	
\$WHOOLFDF,0 \$QDO\JHU	
\$WHOOLFDF,0 &\$/ & FDO\LEUDWRU Z F DAQ LEUDWRU [P/ KLJK F DAQ LEUDWRU &DOLEUDWRU ORW VCS HOF VAL F YDOXH VKHHW	
\$WHOOLFDF,0 &\$/ & FDO\LEUDWRU Z F DAQ LEUDWRU [P/ KLJK F DAQ LEUDWRU &DOLEUDWRU ORW VCS HOF VAL F YDOXH VKHHW	
\$WHOOLFDF,0 9% '77 5(/ UH PH YLDLQJ 77 DJHQW [P/ YLDOV 5H PH DVLQJ \$JHQW HPSW\ 5HDG\3DFN DQFLOODU\ UH DJHQW SDFNV	
\$WHOOLFDF,0 7 7 9% \$H PH G\3DFN DQFLOODU\ UH DJHQW SDFNV FRQWDLQ DQFLOODU\ UH DJHQW ANC	
\$WHOOLFDF,0 7 7 9% \$H PH G\3DFN DQFLOODU\ UH DJHQW SDFNV FRQWDLQ DQFLOODU\ UH DJHQW ANC	

D \$GGLWLRQDO V\ VWHP IOXLGV DUH UHTXLUHG WR RSHUDWH WKH V\ VWHP \$WH
DQG \$WHOOLFDF,0 &OHDQHU)RU V\ VWHP IOXLG LQVWUXFWLRQV IRU XVH UH

2SWLRQDO 0DWHULDOV

7KH IROORZLQJ PDWHULDOV PD\ EH XVHG WR SHUIRUP WKLV DVV

'HVFULSWLRQ	
\$WHOOLFDF,0 9% ',/ GLOXH PH G\3DFN DQFLOODU\ UH DJHQW SDFNV FRQ P/ S DEF N	
\$WHOOLFDF,0 9% 0&0 PDVWHU F XCUEY H HOV RI PDV WCM U FXUYH PDWHULDO PDWHULDO	

\$VVD\ 3URFHGXUH

7KH V\ VWHP DXWRPDWLFDOO\ SHUIRUPV WKH IROORZLQJ VWHS
 :DVKHV WKH DQFLOODU\ UH DJHQW SUREH ZLWK —/ RI 7
 'LVSHQVHV —/ RI VDP SOH LQWR D FXYHWWH
 'LVSHQVHV —/ RI '77 5HOHDVLQJ \$JHQW WKHQ LQFXEDW
 'LVSHQVHV —/ RI 6ROLG 3KDVH WKHQ LQFXEDWHV IRU
 'LVSHQVHV —/ RI /LWH 5HDJHQW WKHQ LQFXEDWHV IRU
 6HSDUDWHV DVSLUDWHV WKHQ ZDVKHV WKH FXYHWWH ZL
 'LVSHQVHV 1/ HDFK RI \$WHOOLFD ,0 \$FLG DQG \$WHOOLFD
 FKHPLOXPLOHV FHW UHDFWLRQ
 5HSRUWV UHVXOWV

3UHSDULQJ WKH 5HDJHQWV

5HDJHQWV DUH OLTXLG DQG UH DG\ WR XVH ZLWK WKH H[FHVS
 \$JHQW %HIRUH ORDGLQJ SULPDU\ UH DJHQW SDFNV RQRW WKH
 LQVSHFW WKH ERWRP RI WKH UH DJHQW SDFN WR HQVXUH W
 LQIRUPDWLRQ DERXW SUHSDULQJ WKH UH DJHQWV IRU XVH UH
 8VH WKLW SURFHGXUH WR SUHSDUH WKH '77 5HOHDVLQJ \$JHQ
 1RWH & DUHIXO SUHSDUDWLRQ RI '77 5HOHDVLQJ \$JHQW LV UHT
 UHVXOWV VLQFH WKH DEVROXWH DPRXQW RI '77 GHOLYHUHG I
 '77 5HOHDVLQJ \$JHQW LPPHGLDWHO\ EHIRUH XVLQJ 8VH WKH
 KRXUV
 \$GG —/ '77 WR P/ 5HOHDVLQJ \$JHQW LQ D WHVW WXE
 0L[WKH '77 DQG 5HOHDVLQJ \$JHQW LQ WKH WHVW WXEH &
 ODERUDWRU\ ILOP DQG LQYHUW WKH WHVW WXEH VHYHUDO
 5HPRYH WKH VHOI VHDOLQJ ODERUDWRU\ ILOP DQG SRXU W
 5HDG\3DFN DQFLOODU\ UH DJHQW SDFN SURYLGHG
 3ODFH D SDFN VHDO RQ WKH GLVSRVDEOH DQFLOODU\ UH D
 RYHU WKH RSHQLQJ RI WKH SDFN DQG SUHV ILUPO\ RQ W
 1RWH '77 5HOHDVLQJ \$JHQW 5HDG\3DFN DQFLOODU\ UH DJHQW S
 XVH SDFNV IURP RQH ORW RI '77 5HOHDVLQJ \$JHQW ZLWK DQ\

3UHSDULQJ WKH 6\ VWHP

(QVXUH WKDW WKH V\ VWHP KDV VXIILFLHQW UH DJHQW SDFNV
 V\ VWHP DXWRPDWLFDOO\ PL[HV UH DJHQW SDFNV WR PDLQWDL
 UH DJHQWV)RU LQIRUPDWLRQ DERXW ORDGLQJ UH DJHQW SDF
)RU DXWRPDWHG GLOXWLRQV HQVXUH WKDW \$WHOOLFD ,0 9%

0DVWHU & XUYH 'HILQLWLRQ

%HIRUH LQLWLDWLQJ FDOLEUDWLRQ RQ HDFK QHZ ORW RI UH
 GHILQLWLRQ YDOXH ~~NY TDE~~ VEDDQ RQ JHWK)RU ORDGLQJ LQVWUXFW
 RQOLQH KHOS

3HUIRUPLQJ & DOLEUDWLRQ

)RU FDOLEUDWLRQ RI WKH \$WHOOLFD ,0 9% DVVD\ XVH WKH
 DFFRUGDQFH ZLWK WKH FDOLEUDWRU LQVWUXFWLRQV IRU XV

&DOLEUDWLRQ)UHTXHQF\

3HUIRUP D FDOLEUDWLRQ LI RQH RU PRUH RI WKH IROORZLQJ FRQ

‡ :KHQ FKDQJLQJ ORW QXPEHUV RI SULPDU\ UHJDJHQW SDFNV

‡ \$W WKH HQG RI WKH ORW FDOLEUDWLRQ LQWHUYDO IRU D VSHF

V\WHP

‡ \$W WKH HQG RI WKH SDFN FDOLEUDWLRQ LQWHUYDO IRU FDOLE

‡ :KHQ LQGLFDWHG E\ TXDOLW\ FRQWURO UHVXOWV

‡ \$IWHU PDMRU PDLQWHQDQFH RU VHUYLFH LI LQGLFDWHG E\ TX

\$W WKH HQG RI WKH RQERDUG VWDELQW\ LQWHUYDO UHSODFH W

QHZ UHJDJHQW SDFN 5HFDOLEUDWLRQ LV QRW UHTXLUH G XQOHVV

6WDELQW\ ,QWHUYDO	'D\
/RW &DOLEUDWLRQ	
3DFN &DOLEUDWLRQ	
5HJDJHQW 2QERDUG 6WDELQW\	

)RU LQIRUPDWLRQ DERXW ORW FDOLEUDWLRQ DQG SDFN FDOLEUDW

)ROORZ JRYHUQPHQW UHJDJHQW RU DFFUHGLWDWLRQ UHTXLUH

,QGLYLGXDO ODERUDWRU\ TXDOLW\ FRQWURO SURJUDPV DQG SURF

FDOLEUDWLRQ

3HUIRUPLQJ 4XDOLW\ &RQWURO

)RU TXDOLW\ FRQWURO RI WKH \$WHOOLFDF,0 9% DVVD\ XVH DQ D

NQRZQ DQDO\WH FRQFHQWUDWLRQ ZLWK DW OHDVW OHYHOV ORZ

GD\ WKDW VDP SOHV DUH DQDO\JHG 8VH WKH TXDOLW\ FRQWURO P

FRQWURO LQVWUXFWLRQV IRU XVH

\$ VDWLVIDFWRU\ OHYHO RI SHUIRUPDQFH LV DFKLHYHG ZKHQ WKH

WKH H[SHFWHG FRQWURO UHQJH IRU WKH V\WHP RU ZLWKLQ \RXU

DSSURSULDWH LQWHUQDO ODERUDWRU\ TXDOLW\ FRQWURO VFKHP

SURFHGXUHV LI WKH UHVXOWV REWDLQH GR QRW IDOO ZLWKLQ W

DERXW HQWHULQJ TXDOLW\ FRQWURO GHILQLWLRQV UHIHU WR WK

)ROORZ JRYHUQPHQW UHJDJHQW RU DFFUHGLWDWLRQ UHTXLUH

,QGLYLGXDO ODERUDWRU\ TXDOLW\ FRQWURO SURJUDPV DQG SURF

TXDOLW\ FRQWURO WHVWLQJ

7HVW TXDOLW\ FRQWURO VDP SOHV DIWHU D VXFFHVVIXO FDOLEUDW

7DNLQJ &RUUHFWLYH \$FWLRQ

,I WKH TXDOLW\ FRQWURO UHVXOWV GR QRW IDOO ZLWKLQ WKH DV

3HUIRUP FRUHFWLYH DFWLRQV LQ DFFRUGDQFH ZLWK HVWDEOLVK

SURWRURO UHIHU WR WKH RQOLQH KHOS

5HVXOWV

&DOFXODWLRQ RI 5HVXOWV

7KH V\WHP GHWHUPLQHV WKH UHVXOW XVLQJ WKH FDOFXODWLRQ

7KH V\WHP UHSRUWV UHVXOWV LQ SJ P/ FRPPRQ XQLWV RU SPR

XQLWV GHILQH ZKHQ VHWLQJ XS WKH DVVD\

&RQYHUVLRQ IRUPXOD SJ P/ SPRO /

)RU LQIRUPDWLRQ DERXW UHVXOWV RXWVLGHOMIDW XLSHFJLILHG
,QWHUYDO

'LOXWLRQV

7KH DVVD\ PHDVXULQJ LQWHUYDO IRU VHUXP DQG SODVPD LV
LQIRUPDWLRQ DERXW GLOXWLRQ RSWLRQV XVHG WR H[WHQG
SJ P/ UHIHU WR WKH RQOLQH KHOS

6DPSOHV ZLWK 0HGLDQ % SJ P/ SPRO / PXVW EH GLOX
REWDLQ DFFXUDWH UHVXOWV

)RU DXWRPDWHG GLOXWLRQV HQVXUH WKDW \$WHOOLFDF ,0 9%
VXIILFLHQW VDPSOH YROXPH LV DYDLODEOH WR SHUIRUP WKH
IDFRU LV VHOHFWHG ZKHQ VFKHGXOLQJ WKH WHVW DV LQG
VHWSRLQW " SJ P/ " SPRO /

6DPSOH	'LOXWLRQ	6DPSOH 9ROXPH	-/
6HUXP DQG SODVPD			
6HUXP DQG SODVPD			

,QWHUSUHWLWLRQ RI 5HVXOWV

5HVXOWV RI WKLV DVVD\ VKRXOG DOZD\ EH LQWHUSUHWHG L
KLVWRU\ FOLQLFDO SUHVHQDWLWLRQ DQG RWKHU ILQGLQJ

/LPLWDWLRQV

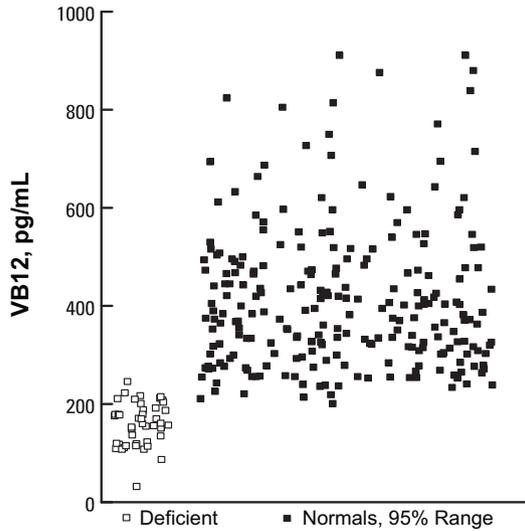
7KH IROORZLQJ LQIRUPDWLRQ SHUWDLQV WR OLPLWDWLRQV R
‡ 3UHVHUYDWLYHV VXFK DV IOXRULGH DQG DVFRUELF DFLG
‡ ([FHVVLYH H[SRVXUH RI VDPSOHV WR 0XHW PD\ DOWHU YL

([SHFWHG 9DOXH

7KH UHJDJHQW IRUPXODWLRQV XVHG RQ WKH \$WHOOLFDF ,0 \$Q
\$'9,\$ &HQWDXUŠ DQG \$&6 OE V\WHPV ([SHFWHG YDOXH ZH
V\WHP DQG FRQILUPHG E\ DVVD\ 0HGLDQ RSWLRQV UHIHU WR
'DWD ZHUH REWDLQHG RQ VHUXP VDPSOHV LQFOXGLQJ
LQGLYLGXDOV DQG VDPSOHV IURP SIGWILLFDOV LQSDVWV
DSSDUHQWO\ KHDOWK\ LQGLYLGXDOV IHOO LQ WKH UDQJH

&DWHJRU\	0HGLDQ SJ P/	5DQJH SJ P/	0HGLDQ SPRO /	5DQJH SPRO /
1RUPDO		2		2
'HILFLHQW		2		2

5HIHU WR WKH ILJXUH EHORZ IRU D VFDWWHUJUDP RI WKHVV UHVX
6DPSOH 'LVWULEXWLRQ



\$V ZLWK DQG DRQRVWLF DVVD\V HDFK ODERUDWRU\ VKRXOG GHWH
LQWHUYDO IRU WKH GLDJQRVWLF &RQVXLQJ WKH HVVW\OHW DWVX
RQO\

3HUIRUPDQFH & KDUDFWHULVWLFV

7KH UHJDJHQV IRUPXODWLRQV XVHG RQ WKH \$WHOOLFD ,0 \$QDO\JH
\$'9,\$ &HQWDXU DQG \$&6 V\WHPV 6RPH SHUIRUPDQFH FKDUDFW
DVVD\ ZHUH HVWDEOLVKHG XVLQJ WKH \$'9,\$ &HQWDXU V\WHP

0HDVXULQJ ,QWHUYDO

7KH \$WHOOLFD ,0 9% DVVD\ SURYLGHV UHVXOWV IURP ² SJ P/
ORZHU HQG RI WKH PHDVXULQJ LQWHUYDO LV GHILQH E\ WKH DQ
EHORZ WKH PHDVXULQJ LQWHUYDO DV SJ P/ SPRO / :KHQ V
PHDVXULQJ LQWHUYDO RQHIHU WR

6SHFLILFLW\

7KH FURVV UHDFWLYLW\ ZLWK FRELQDPLGH ZDV GHWHUPLQH E\ D
VDPSOHV FRQWDLQLQJ DQG SJ P/ DRG SPRO / P
LQWHUIHUHQFH ZDV IRXQG DW WKHVV OHYHOV
,QWHUIHUHQFH WHVWLQJ ZDV GHWHUPLQH DFFRUGLQJ WR &/6, 'R
5HVXOWV ZHUH HVWDEOLVKHG XVLQJ WKH \$'9,\$ &HQWDXU V\WHP

'HWHFWLRQ & DSDELOLW\

'HWHFWLRQ FDSDELOLW\ ZDV GHWHUPLQH LQ DFFRUGLQJ ZLWK
LV GHVLJQH WR KDYH DQDO\WLFDO VHQVLWLYLW\ RI " SJ P/
" SJ P/ SPRO / DQG OLPLW RI GHWHFWLRQ /R' " SJ P/ S
5HSUHVHQWDWLYH GHWHFWLRQ FDSDELOLW\ GDWD DUH VKRZQ EH
ODERUDWRULHV PD\ YDU\ IURP WKH GDWD SUHVHQWHG

\$QDO\WLFDO VHQLVLWLYLW\ LV GHILQHGWKDW WFKR UFRUQVSHQVMDW
 5/8V WKDW DUH VWDQGDUG GHYLDWLRQV OHVV WKDQ WKH P
 WKH YLWQJHU %WDQGDUG 7KLV UHVSQRVH LV DQ HVWLPDWH
 FRQFHQWUDWLRQ ZLWK FRQILGHQFH 7KH DQDO\WLFDO VH
 SJ P/ SPRO /

7KH /R% FRUHVSRQGV WR WKH KLJKHVW PHDVXUHPHQW UHVX
 EODQN VDPSOH 7KH /R% RI WKH \$WHOOLF D ,0 9% DVVD\ LV

7KH /R' FRUHVSRQGV WR WKH ORZHVWVWDELOLW\ RI WKH
 SUREDELOLW\ RI 7KH /R' IRU WKH \$WHOOLF D ,0 9% DVVD\
 GHWHUPLQH XVLQJ GHWHUPLQDWLRQV ZLWK EODQN DG
 RI SJ P/ SPRO /

3UHFLVLRQ

3UHFLVLRQ ZDV GHWHUPLQH LQ DFFRUGDWLRQ ZLWK 16 'RFX
 DVVD\HG RQ DQ \$WHOOLF D ,0 \$QDO\JHU LQ GXSOFLDWH LQ U
 GHVLJQH WR KDYH ZLWKLQSDERUDWRU\ SUHFLVLRQ RI " 0
 " SPRO / " & 9 IRU VDPSOHV IURP ² SJ P/ ² SP
 " & 9 IRU VDPSOHV IURP ² SJ P/ ² SPRO / 7KH I
 REWDLQH

0HDQ	5SHDWDELOLW\ :LWKLQ /DERUDWRU\ 3UHFL
6DPSOH 7\SH ^D	6 ^E & 9
SJ P/ SPRO	k SJ P/ SPRO / k SJ P/ SPRO /
/LWKLXP KHSULQ \$	
6HUXP %	
6HUXP &	
&RQWURO	
&RQWURO	
&RQWURO	

^D 1XPEHU RI VDPSOHV WHVWHG
^E 6WDQGDUG GHYLDWLRQ
^F &RHIILFLHQW RI YDULDWLRQ

\$VVD\ UHVXOWV REWDLQH DW LQGLYLGXDO ODERUDWRULHV

\$VVD\ &RPSDULVRQ

7KH \$WHOOLF D ,0 9% DVVD\ LV GHVLJQH WR KDYH D FRUHV
 RI " FRPSDUHG WR WKH '\$ &HQWDXU 9% DVVD\ \$VVD\
 XVLQJ WKH ZHLJKWHG 'HPLQJ UHJUHVLRQ PRGH LQ DFFRUG
 7KH IROORZLQJ UHVXOWV ZHUH REWDLQH

6SHFLPHQ &RPSDUDWLYH \$VVD\ UHJVLRQ (TXDPSOH , QWHUYDO 0	
6HUXP \$'9,\$ &HQWDXU 9%	[SJ P/ ² SJ P/
\	[SPRO / ² SPRO /

^D 1XPEHU RI VDPSOHV WHVWHG
^E &RUUHODWLRQ FRHIILFLHQW

)RU VHUXP VDP SOHV LQ WKH UDQJH RI ² SJ P/ ² SPRO
EHWZHHQ WKH \$'9,\$ &HQWDXU 9% DVVD\ DQG WKH \$&6 9% DV

6SHFLPHQ	RPSDUDWLYH	\$VVD\	UHVLRQ	(TXDWR	QHWUIYDO
6HUXP	\$&6	9%	\	[SJ P/ ² SJ P/
			\	[SPRO / ² SPRO /

D 1XPEHU RI VDP SOHV WHVWHG
E &RUUHODWLRQ FRHIILFLHQW

\$JUHHPHQW RI WKH DVVD\ PD\ YDU\ GHSHQGLQJ RQ WKH VWXG\ G
VDP SOH SRSXODWLRQ XVHG \$VVD\ UHVXOWV REWDLQH G DW LQGLY
GDWD SUHVH QWHG

6SHFLPHQ (TXLYDOHQF\

6SHFLPHQ HTXLYDOHQF\ ZDV GHWHUPLQH XVLQJ WKH 'HPLQJ OLQ
DFFRUGDQFH ZLWK &/6, 'RFXHQWV ZLWJ UHVXOWV ZHUH REWDLQH

6SHFLPHQ	SHIHUHQFH	6SHFLPHQ	UHVLRQ	(TXDWR	QHWUIYDO
/LWKLXP	KHSHUXP	\	[SJ P/ ² SJ P/	
		\	[SPRO / ² SPRO /	
('7\$	SODVP	HUXP	\	[SJ P/ ² SJ P/
			\	[SPRO / ² SPRO /

D 1XPEHU RI VDP SOHV WHVWHG
E &RUUHODWLRQ FRHIILFLHQW

\$JUHHPHQW RI WKH VSHFLPHQ W\SHV PD\ YDU\ GHSHQGLQJ RQ WKH
SRSXODWLRQ XVHG \$VVD\ UHVXOWV REWDLQH G DW LQGLYLGXDO C
SUHVH QWHG

,QWHUIHUHQFHV

,QWHUIHUHQFH WHVWLQJ ZDV SHUIRUPHG LQ DFFRUGDQFH ZLWK &
+HPRO\VLV ,FWHUXV DQG /LSHPLD +,/

6SHFLPHQV	WKDW DUDYH	DQ	LQVLJQLILFDQW	HIHFW	RQ WKH DVVD\ XS WR
KHPRO\]HG		PJ	G/ RI	KHPRJORELQ	
OLSHPLF		PJ	G/ RI	WULJO\FHULGHV	
LFWHULF		PJ	G/ RI	ELOLUXELQ	

5HVXOWV ZHUH HVWDEOLVKHG XVLQJ WKH \$'9,\$ &HQWDXU V\ VWHP
ODERUDWRULHV PD\ YDU\ IURP WKH GDWD SUHVH QWHG

'LOXWLRQ 5HFRYHU\

)LYH KXP DQ VHUXP VDP SOHV LQ WKH UDQJH ² SJ P/
ZHUH GLOXWHG DQG ZLWK 9% ',/ DQG DVVD\HG IRU
7KH UHFRYHULHV UDQJHG IURP ² ZLWK D PHDQ RI

6DPSOH 'LOXWLRQ	2EVHUYHG([SHFWHG	2EVHUYHG([SHFWHG	5HFRYHU\
SJ P/	SJ P/	SPRO /	SPRO /
3	3	3	3
0HDQ			
3	3	3	3
0HDQ			
3	3	3	3
0HDQ			
3	3	3	3
0HDQ			
3	3	3	3
0HDQ			
0HDQ			

5HVXOWV ZHUH HVWDEOLVKHG XVLQJ WKH '\$9,\$ &HQWDXU V\V
 ODERUDWRULHV PD\ YDU\ IURP WKH GDWD SUHVHQWHG

6SLNLQJ 5HFRYHU\

9DU\LQJ DPRXQWV ZHYHWDPLQ%WR VHUXP VDP SOHV ZLWK HQGRJ
OHYHOV RI 2 SJ P/ 2 SPRO / 7KH UHFRYHULHV UDQJHG IU
D PHDQ RI

6DPSOH	SJ P/	SJ P/	SPRO /	SPRO /	5HFRYHU\
3			3		3
0HDQ					
3			3		3
0HDQ					
3			3		3
0HDQ					
3			3		3
0HDQ					
0HDQ					

5HVXOWV ZHUH HVWDEOLVKHG XVLQJ WKH '\$9,\$ &HQWDXU V\ VWHP
ODERUDWRULHV PD\ YDU\ IURP WKH GDWD SUHVHQWHG

6WDQGDUGLJDWLRQ

7KH \$WHOOLFDFD ,0 9% DVVD\ VWDQGDUGLJDWLRQ LV WUDFHDEOH V
XVLQJ 8 6 3 8QLWHG 6WDWHV 3KDUPDFRSHLD PDWHULDO \$VVLJQ
WUDFHDEOH WR WKLV VWDQGDUGLJDWLRQ

7HFKQLFDO \$VVLVWDQFH

)RU FXVWRPHU VXSSRUW FRQWDFW \RXU ORFDO WHFKQLFDO VXSS
VLPHQV FRP KHDOWKLQHHUV

5HIHUUHQFHV

&KHQ ,: 6SHUOLQJ 0, +HPLQ,CHU3HSV FHL WDP.DSOD KR/\$V HLQV
&OLQLFDO &KMP LR XLUA &9 ORVE\ 2

%UHZVWHU 0\$ 9LWDPLQV ,Q &DSQDDQ/\$ &KHPFLW\$U\HGVHRU
&RUUHODWLRQLV &9 ORVE\ 2

OLDOWDERUDWRU\ 0HGLFLQHWK+HSDWWRRLXLV &9 ORVE\

%XUWL V \$& \$VKZRRG (5 9LWDPLQV WERRNQR7&HWQDFDQG&KH
3KLOGGHOSKLD :% 6DXQGHUV &R 2

6WHLQNDPS 5& 9LWDPLQ % DQG IROLF DFLG FOLQLFDO D
,Q %UHZVWHU 0\$ 1XDWLRQLRQDO (OHPHQWV DQGH&QRNFDO
3OHQXP 3XEOLVKLQJ &RUS 2

%HXHUOHLQ)- 7HVWLQJ XDUUDWDLH VHIRU DQHPLDV

&HQWHUV IRU 'LVHVDH &RQWURO 3HUVSHFWLYHV LQ GLVHI
XSGDWH 8QLYHUVDO SUHFDXWLRQV IRU SUHYHQWLRQ RI W
YLUXV KHSDWLWL V % YLUXV DQG RWKHU EORRGRUQH SDW
2 2

&OLQLFDO DQG /DERUDWRURFWHQGHU GRU, QKMLWQGH
%ORRG 6SHFLPHQV IRU &RPPRQ /DERUDWRU\ 7HVWV \$SSUR
:D\QH 3\$ &OLQLFDO DQG /DERUDWRU\ 6WDQGDUGV ,QVWLW

&OLQLFDO DQG /DERUDWRURFWHQGHU GRU, QKMLWQGH
2FFXSDWLRQDOO\ \$FTXLHG ,QHFWRQV \$SSURYHG *XLGH
&OLQLFDO DQG /DERUDWRU\ 6WDQGDUGV ,QVWLWXXH

&OLQLFDO DQG /DERUDWRURFWHQGHU GRU, QKMLWQGH
%ORRG 6SHFLPHQV E\ 9HQLSXQFWXUH \$SSURYHG \$WDOLOU
DQG /DERUDWRU\ 6WDQGDUGV ,QVWLWXXH &/6, 'RFXPH

&OLQLFDO DQG /DERUDWRURFWHQGHU GRU, QKMLWQGH
%ORRG 6SHFLPHQ &ROOHFWLRQ \$SSURYHG \$WDOLOU
/DERUDWRU\ 6WDQGDUGV ,QVWLWXXH &/6, 'RFXPHQW *

&OLQLFDO DQG /DERUDWRURFWHQGHU GRU, QKMLWQGH
5HIHUUHQFH ,QWHUYDOV LQ WKH &OLQLFDO /DERUDWRU\ \$S
3\$ &OLQLFDO DQG /DERUDWRU\ 6WDQGDUGV ,QVWLWXXH

&OLQLFDO DQG /DERUDWRURFWHQGHU GRU, QKMLWQGH
3URSRVHG *XDGHOLOH &OLQLFDO DQG /DERUDWRU\ 6WDQGD
'RFXPHQW (3 s3

&OLQLFDO DQG /DERUDWRURFWHQGHU GRU, QKMLWQGH
/DERUDWRU\ 0HDVXUHPHQW 3URFHGXUHV \$SSURYHG \$XLGH
&OLQLFDO DQG /DERUDWRU\ 6WDQGDUGV ,QVWLWXXH

&OLQLFDO DQG /DERUDWRURFWHQGHU GRU, QKMLWQGH
0HDVXUHPHQW 3URFHGXUHV \$SSURYHG \$XLGH
/DERUDWRU\ 6WDQGDUGV ,QVWLWXXH &/6, 'RFXPHQW (

&OLQLFDO DQG /DERUDWRURFWHQGHU GRU, QKMLWQGH
(VWLPDWLRQ 8VLQJ 3DWLHQW 6DPSOHV \$SSURYHG *XDGHOLOH
DQG /DERUDWRU\ 6WDQGDUGV ,QVWLWXXH &/6, 'RFXPH

&OLQLFDO DQG /DERUDWRURFWHQGHU GRU, QKMLWQGH
\$SSURYHG *XLGHOLQH 3DURFHGXUHV &OLQLFDO DQG /DERUDWR
,QVWLWXXH &/6, 'RFXPHQW (3 s\$

'HILQLWLRQ RI 6\PEROV

7KH IROORZLQJ V\PEROV PD\ DSSHU RQ WKH SURGXFW ODEHOLQJ

6\PERO	6\PERO 7LWOH DQG 'HVFULSWLRQ
	&RQVXOW LQVWUXFWLRQV IRU XVH
 Rev. 01	9HUVLRQ RI LQVWUXFWLRQV IRU XVH
 siemens.com/healthcare	,QWHUQHW 85/ DGGUHVV WR DFFHVV WKH HOHFWURQLF LQVWUXFW
 siemens.com/document-library	
Rev. REVISION	5HYLVLRQ
	&DXWLRQ &RQVXOW LQVWUXFWLRQV IRU XVH RU DFFRPSDQ\LQJ GRFXPHQ VXFK DV ZDUQLQJV DQG SUHFDXWLRQV WKDW FDQRW IRU D Y RQ WKH PHGLFDO GHYLFH
	%LRORJLFDO ULVNV 3RWHQWLDO ELRORJLFDO ULVNV DUH DVVRFLDWHG ZLWK WKH F
	&RUURVLYH
	'DQJHURXV WR HQYLURQPHQW
	,UULWDQW 2UDO GHUPDO RU LQKDODWLRQ KDJDUG
	,QKDODWLRQ KDJDUG 5HVSLUDWRU\ RU LQWHUQDO KHDOWK
)ODPPDEOH)ODPPDEOH WR H[WUHPHO\ IODPPDEOH
	2[LGL]LQJ
	([SORVLYH
	7R[LF
	&RPSUHVVHG JDV
	.HHS DZD\ IURP VXQOLJKW 3UHYHQW H[SRVXUH WR VXQOLJKW DQG KHDW

6\PERO	6\PERO 7LWOH DQG 'HVFULSWLRQ
	8S 6WRUH LQ DQ XSULJKW SRVLWLRQ
	'R QRW IUHH]H
	7HPSHUDWXUH OLPLW 8SSHU DQG ORZHU OLPLWV RI WHPSHUDWXUH LQGLFDWRU ORZHU KRUL]RQWDO OLQHV
	+DQGGKHOG EDUFRGH VFDQQHU
	,Q YLQWURQRVWLF PHGLFDO GHYLFH
	&RQWDLQV VXIILFLHQW IRU Q! WHVWV 7RWDO QXPEHU RI ,9' WHVWV WKH \VWHP FDQ SHUIRUP Z DGMDFHQW WR WKH \PERO
RxOnly	3UHVFULSWLRQ GHYLFH 86 RQO\ \$SSOLHV RQO\ WR 8QLWHG 6WDWHV UHJLVWHUHG ,9' DVV &\$87,21)HGHUO 86\$ ODZ UHVWULFWV WKLV GHYLFH W OLFHQVHG KHDOWKFDUH SURIHVVLRQDO
	0L[LQJ RI VXEVWDQFHV 0L[SURGXFW EHIRUH XVH
	5HFRQVWLWXWH DQG PL[O\RSKLOL]HG SURGXFW EHIRUH
	7DUJHW
	,QWHUYDO
	/HJDO 0DQXIDFWXUHU
	\$XWKRUL]HG 5HSUHVHQWDWLYH LQ WKH (XURSHDQ &RPPX
	8VH E\ GDWH 8VH E\ WKH GHVLJQDWHG GDWH
	%DWFK FRGH
	&DWDORJ QXPEHU
	5HF\FOH
	3ULQWHG ZLWK VR\ LQN
	&(0DUN

6\PERO	6\PERO 7LWOH DQG 'HVFULSWLRQ
	&(0DUN ZLWK QRWLILHG ERG\ ,' QXPEHU 1RWLILHG ERG\ ,' QXPEHU FDQ YDU\
YYYY-MM-DD	'DWH IRUPDW \HDUsPRQWksGD\
CHECKSUM	9DULDEOH KH[DGHFLPDO QXPEHU WKDW HQVXUHV WKH 0DVWU GHILQLWLRQ YDOXH HQWHUHG DUH YDOLG
UNITS C	&RPPRQ 8QLWV
UNITS SI	,QWHUQDWLRQDO 6\WHP RI 8QLWV
MATERIAL	0DWHULDO
MATERIAL ID	8QLTXH PDWHULDO LGHQWLILFDWLRQ QXPEHU
CONTROL NAME	1DPH RI FRQWURO
CONTROL TYPE	7\SH RI FRQWURO

/HJDO ,QIRUPDWLRQ

\$WHOOLFDF 5HDG\3DFN '\$9,\$ &HQWDXU DQG \$&6 DUH WUDGHPD
'LDJQRVWLFV

\$OO RWKHU WUDGHPDUNV DQG EUDQGV DUH WKH SURSHU\ RI WKH
< 2 6LPHQV +HDOWKFDUH 'LDJQRVWLFV \$OO ULJKWV UHVHU

 6LPHQV +HDOWKFDUH 'LDJQRVWLFV ,QF
%HQHGLFW \$YHQXH
7DUU\WRZQ 1<
86\$
VLPHQV FRP KHDOWKLQHUV

6LPHQV +HDOWKLQHUV +HDGTXDUWHUV
6LPHQV +HDOWKFDUH *PE+
+HQNHVWU
(UODQJHQ
*HUPDQ\
3KRQH
VLPHQV FRP KHDOWKLQHUV