16 K-Chief 700

16.xx Field Station FS-400C-R1

Ref:

Document name: Kongsberg FS-400C-R1 Maintenance Manual

Document nr: 330462/A

Document name: Power and Wiring Diagram FS-400 RBus

Document nr: 323448/B

Document name: HW Loop Typical DI-01

Document nr: 306371/C

Document name: Power and Wiring Diagram R-Hub for redundant RCU FS-240/FS-400

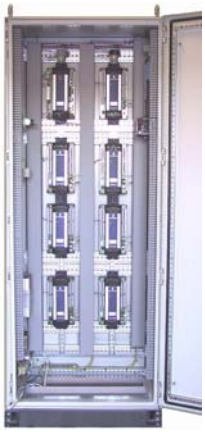
Document nr: 328894/A

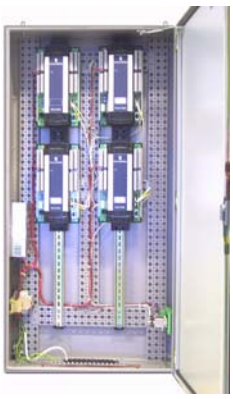
DMS no: xx

Objectives

- Be familiar with the layout of the FS-60/120/240/400 cabinets
- To obtain knowledge about the power and wiring of the field station
- Learn the basics about the RBus
- Get an introduction to “loop typical” documents

Field Station Cabinets





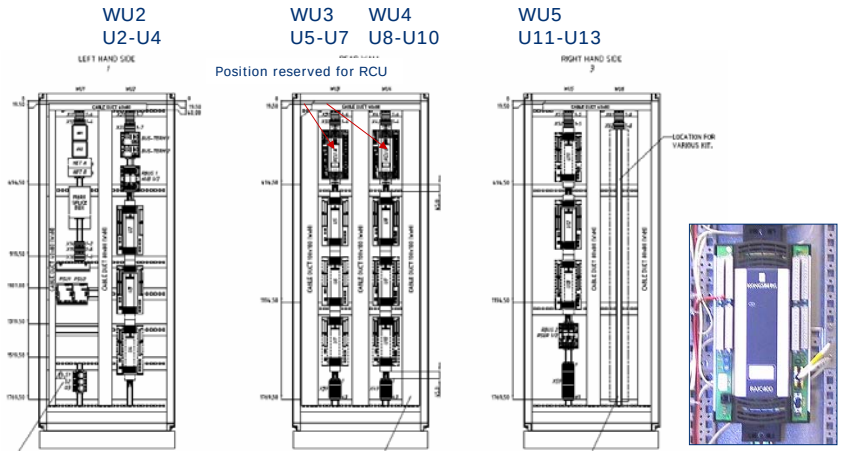
FS-400	FS-240	FS-120	FS-60
FS-400C	FS-240C	FS-120C	FS-60C
FS-400C-R1	FS-240C-R1	FS-120C-R1	

Enclosure

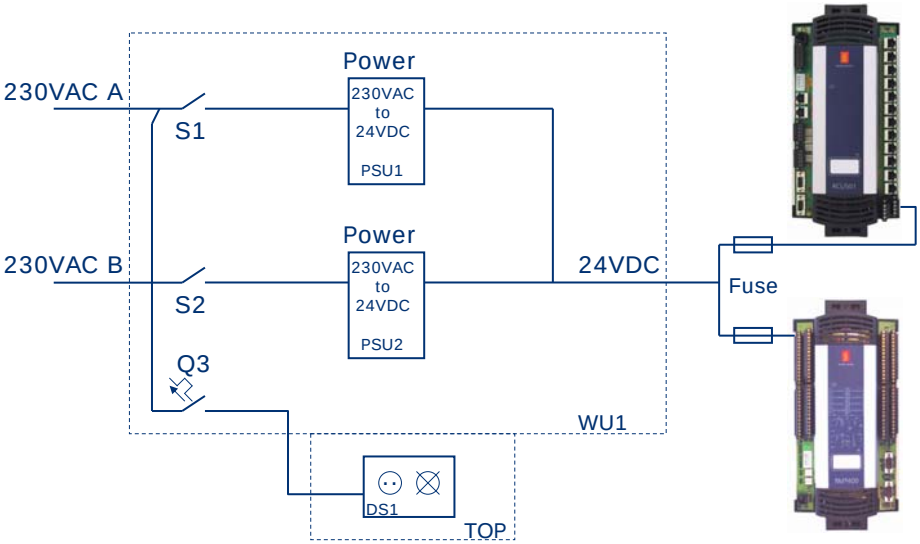
Enclosure :

- Cabinets for 60 ~ 400 I/O
- Interfaces for safe area as well as intrinsic safe circuits
- Powered from 115 / 230 VAC UPS systems (single or redundant)
- IP 44
- 806 x 2202 x 805 mm

Cabinet Layout FS-400C-R1



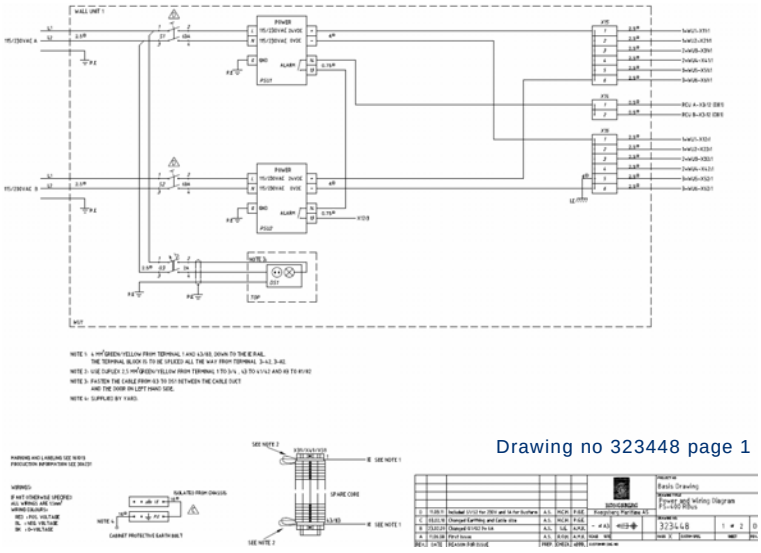
Cabinet Power Distribution



Reference Manual

- Maintenance Manuals
  - For the main building blocks
  - FS400C-R1
  - KM-OS
- Hardware Module Descriptions
  - Detailed information for each module
  - Eg. RCU501 and RMP420
- Drawings
  - Power and Wiring
  - Loop Typicals
  - Layouts

Power and Wiring Diagram of FS-400 RBus



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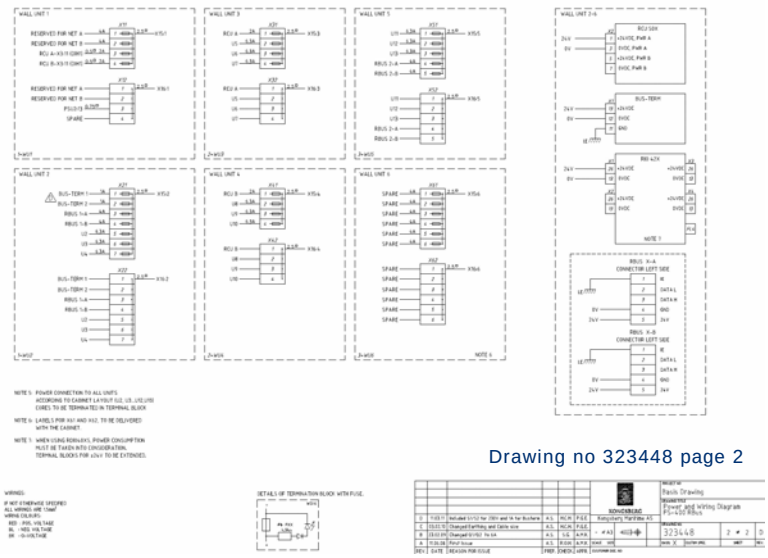
Power and Wiring Diagram of FS-400 RBus



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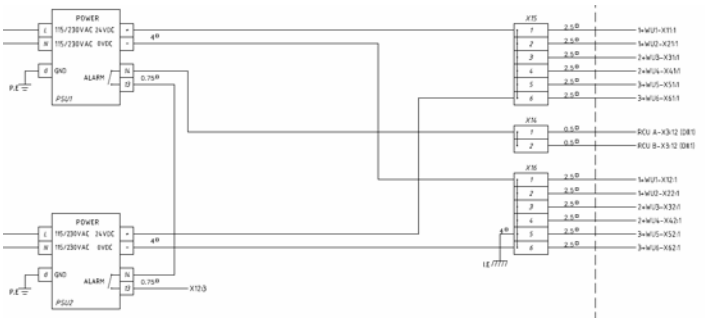
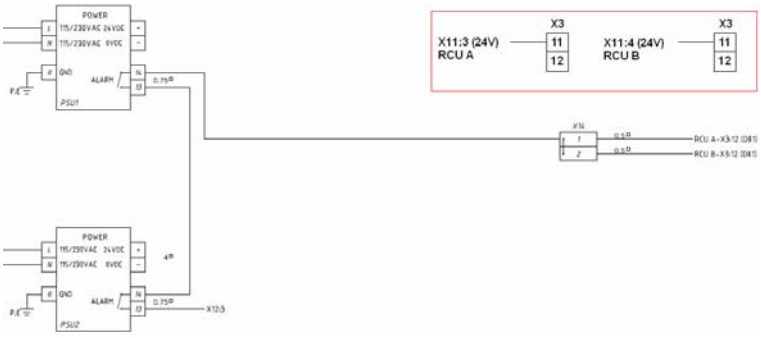
Power Alarm – RCU onboard IO

- Power alarm connected to X3 on RCU A and B
- 24V loop power on X11:4 and 0V X12:4

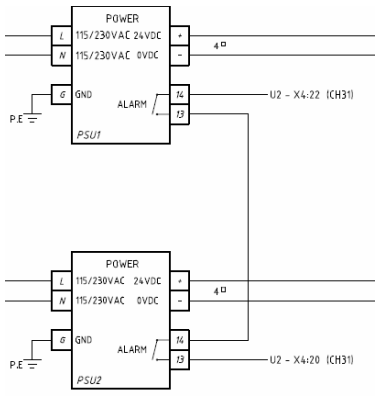


Power Alarm Details – RCU onboard IO



Power Alarm - RIO

- Power alarm connected to channel 31 on U2
- Loop is powered by RIO



Example of WU1 components

Net switch A

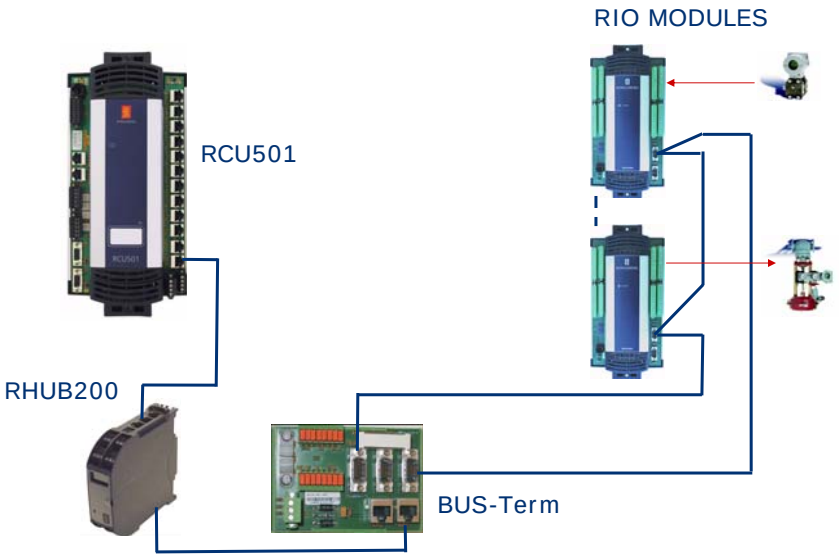
Net switch B

Patch box: Net A, Net B

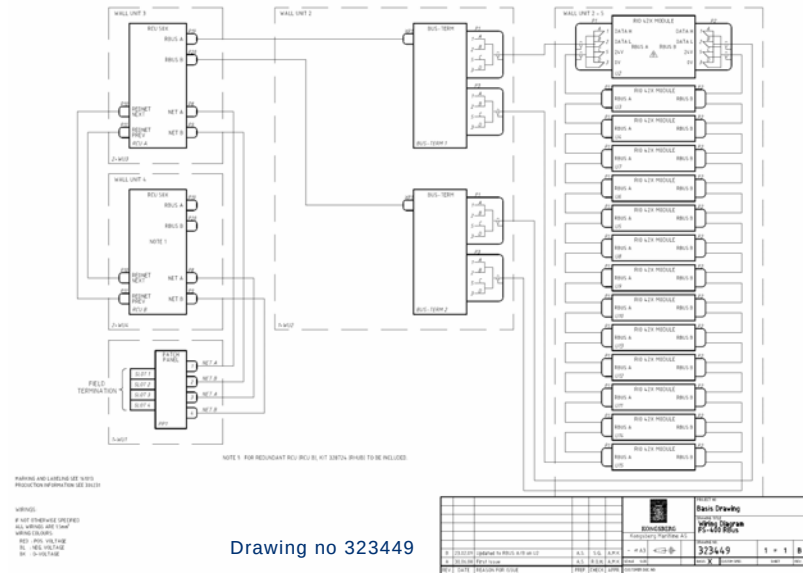
2 power supplies

Main circuit breakers Q1-Q3

R-BUS solution



Wiring Diagram FS-400 Rbus



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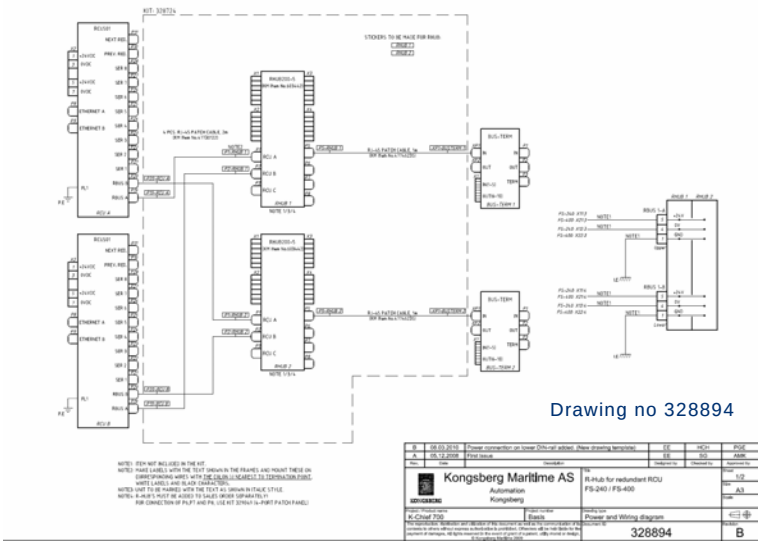
RHUB for Redundant RCU



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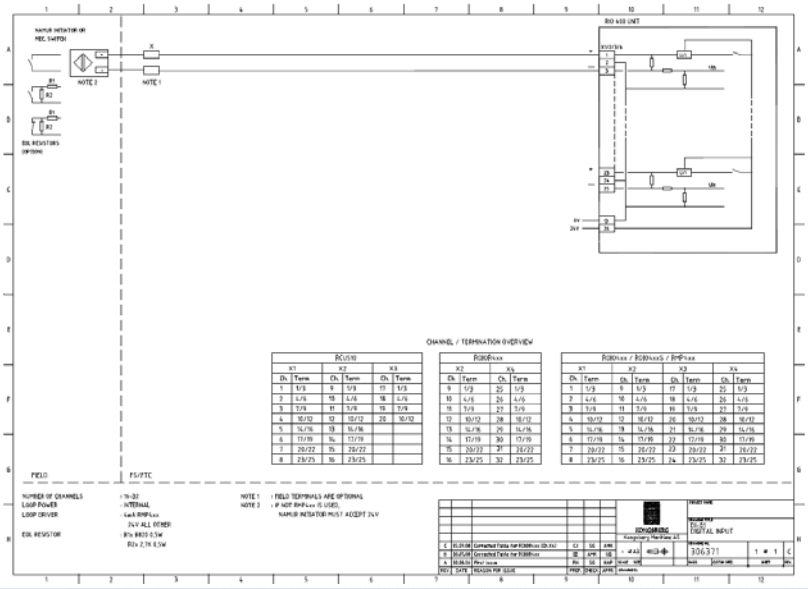
IO-List ("old" naming)

XA-032423			NO.1 TH HV PNL (S) INSUL LOW				6	X1	17		19	RDI1000
XA-032422			NO.1 TH HV PNL (S) CB TRIPPED				7	X1	20		22	RDI1000
XA-032457			NO.1 TH HV PNL (S) 110V DC FAIL				8	X1	23		25	RDI1000
XA-032456			NO.1 TH HV PNL (S) 220V AC FAIL				9	X2	1		3	RDI1000
TIAH-021209			NO.1 TH DRIVE BEARING TEMP NDE				10	X2	4	5	6	RAIPT1000
TIAH-021207			NO.1 TH DRIVE HOT AIR TEMP				11	X2	7	8	9	RAIPT1000
TIAH-021206			NO.1 TH DRIVE COLD AIR TEMP				12	X2	10	11	12	RAIPT1000
TIAH-021203			NO.1 TH DRIVE WINDING W				13	X2	14	15	16	RAIPT1000
TIAH-021202			NO.1 TH DRIVE WINDING V				14	X2	17	18	19	RAIPT1000
TIAH-021201			NO.1 TH DRIVE WINDING U				15	X2	20	21	22	RAIPT1000
TIAH-021208			NO.1 TH DRIVE BEARING TEMP DE				16	X2	23	24	25	RAIPT1000
MC-021109			NO.1 TH DCU START BLOCK				17	X3	1	2		RDO1000_RMP
XA-021116			NO.1 TH DCU CONTROL POWER FAIL				18	X3	4		6	RDI1000
XA-021115			NO.1 TH POWER LIMIT ACTIVATED				19	X3	7		9	RDI1000
XA-021110			NO.1 TH DCU UPS COMMON ALARM				20	X3	10		12	RDI1000
MC-021107			NO.1 TH DCU STOP				21	X3	14	15		RDO1000_RMP
PS No:	31	**Cabinet:**	FS31	**RIO Unit:**	31/RMP400/04	**Type:**	RMP400-1		**Slot:**	4		
IO Tag			Description				Ch	X	Tb A	Tb B	Tb C	Loop typical
MC-021106			NO.1 TH DCU START				22	X3	17	18		RDO1000_RMP
MI-021105			NO.1 TH DCU LOCAL/REMOTE				23	X3	20		22	RDI1000
MY-021108			NO.1 TH DCU RESET				24	X3	23	24		RDO1000_RMP
MI-021104			NO.1 TH DCU RUNNING				25	X4	1		3	RDI1000
MA-021103			NO.1 TH DCU COMMON ALARM				26	X4	4		6	RDI1000
MA-021102			NO.1 TH DCU FAULT				27	X4	7		9	RDI1000
XA-021112			NO.1 TH EM PB ACTIVATED				28	X4	10		12	RDI1000
MI-021101			NO.1 TH DCU READY TO START				29	X4	14		16	RDI1000
PS No:	31	**Cabinet:**	FS31	**RIO Unit:**	31/RMP400/06	**Type:**	RMP400-1		**Slot:**	6		
IO Tag			Description				Ch	X	Tb A	Tb B	Tb C	Loop typical
JI-021114			NO.1 TH DCU ACTUAL POWER				1	X1	1		3	RAIC1000
NY-021113			NO.1 TH DCU SPEED REF				2	X1	4	5		RAOC1000_1
XC-021114			NO.1 TH - POWER AVAILABLE				3	X1	7	8		RAOC1000_1
NI-021113			NO.1 TH DCU ACTUAL SPEED				4	X1	10		12	RAIC1000
XA-021111			NO.1 TH EM STOP LOOP FAIL				5	X1	14		16	RDI1000
XA-021210			NO.1 TH MOTOR COOLER LEAK				6	X1	17		19	RDI1000
MA-062603			NO.1 TH RM SUPPLY FAN FAIL				7	X1	20		22	RDI1000
MI-062603B			NO.1 TH RM SUPPLY FAN LOC/REM				8	X1	23		25	RDI1000
MI-062603A			NO.1 TH RM SUPPLY FAN RUN				9	X2	1		3	RDI1000
MC-062603A			NO.1 TH RM SUPPLY FAN START				10	X2	4	5		RDO1000_RMP

IO-List (new naming)

IO Tag	IO Description	Signal Tag	Cabinet	Pcu	Pos	Ch	X	TA	TB	TC	Card Type	Loop
				40	5	18						
XA-031406	C E/R NO.2 MGEN CB TRIPPED & BLOCKED	CB-031401/Tripped	FS40	40	5	19	X3	7		9	RMP420	DI-01
XA-031409	C E/R NO.2 MGEN PRIME MOVER STOP CMD	XA-031409/ProMeas	FS40	40	5	29	X3	10		12	RMP420	DI-01
XI-014137	CENT E/R NO.2 MGE CONTROL FM HS	XI-014137/ProMeas	FS40	40	5	21	X3	14		16	RMP420	DI-01
XC-031401	CENT E/R NO.2 MGEN CB OPEN	CB-031401/ActOpen	FS40	40	5	22	X3	17	18		RMP420	DO-01
XC-031402	CENT E/R NO.2 MGEN CB CLOSE	CB-031401/ActClose	FS40	40	5	23	X3	20	21		RMP420	DO-01
XI-031403	CENT E/R NO.2 MGEN CB REMOTE READY	CB-031401/Remote	FS40	40	5	24	X3	23		25	RMP420	DI-01
XI-031405	CENT E/R NO.2 MGEN CB CLOSED	CB-031401/InClosed	FS40	40	5	25	X4	1		3	RMP420	DI-01
XA-031408	C E/R NO.2 MGEN PRIME MOVER BLOCK ST	XA-031408/ProMeas	FS40	40	5	26	X4	4		6	RMP420	DI-01
NZC-122438	CENT MSB RM SUPPLY DAMPER CLOSE	ND-122438/InClosed	FS40	40	5	27	X4	7		9	RMP420	DI-01
NZO-122438	CENT MSB RM SUPPLY DAMPER OPEN	ND-122438/InOpened	FS40	40	5	28	X4	10		12	RMP420	DI-01
XA-031407	CENT E/R NO.2 MGEN EARTH SWITCH CLSD	XA-031407/ProMeas	FS40	40	5	29	X4	14		16	RMP420	DI-01
XI-031404	CENT E/R NO.2 MGEN CB OPENED	CB-031401/InOpened	FS40	40	5	30	X4	17		19	RMP420	DI-01
NZC-122439	CENT MSB RM RETURN DAMPER CLOSE	ND-122439/InClosed	FS40	40	5	31	X4	20		22	RMP420	DI-01
NZO-122439	CENT MSB RM RETURN DAMPER OPEN	ND-122439/InOpened	FS40	40	5	32	X4	23		25	RMP420	DI-01
IIAH-031411	CENT E/R NO.2 MGEN CURRENT	IIAH-031411/ProMeas	FS40	40	7	1	X1		2	3	RMP420	AI-02
JIAHL-031412	CENT E/R NO.2 MGEN POWER	JIAHL-031412/ProMeas	FS40	40	7	2	X1		5	6	RMP420	AI-02
NIAHL-031413	CENT E/R NO.2 MGEN FREQUENCY	NIAHL-031413/ProMeas	FS40	40	7	3	X1		8	9	RMP420	AI-02
EIAHL-031414	CENT E/R NO.2 MGEN VOLTAGE	EIAHL-031414/ProMeas	FS40	40	7	4	X1		11	12	RMP420	AI-02
XA-031428	C E/R NO.2 MGEN COOL WATER LEAKAGE	XA-031428/ProMeas	FS40	40	7	5	X1	14		16	RMP420	DI-01
TIAH-031423	CENT E/R NO.2 MGEN WINDING T TEMP	TIAH-031423/ProMeas	FS40	40	7	6	X1	17	18	19	RMP420	AI-15
TIAH-031427	C E/R NO.2 MGEN D END WARM AIR TEMP	TIAH-031427/ProMeas	FS40	40	7	7	X1	20	21	22	RMP420	AI-15
TIAH-031426	C E/R NO.2 MGEN N-END COLD AIR TEMP	TIAH-031426/ProMeas	FS40	40	7	8	X1	23	24	25	RMP420	AI-15
TIAH-031425	C E/R NO.2 MGEN D-END BEARING TEMP	TIAH-031425/ProMeas	FS40	40	7	9	X2	1	2	3	RMP420	AI-15
TIAH-031424	C E/R NO.2 MGEN N-END BEARING TEMP	TIAH-031424/ProMeas	FS40	40	7	10	X2	4	5	6	RMP420	AI-15
TIAH-031422	CENT E/R NO.2 MGEN WINDING S TEMP	TIAH-031422/ProMeas	FS40	40	7	11	X2	7	8	9	RMP420	AI-15
TIAH-031421	CENT E/R NO.2 MGEN WINDING R TEMP	TIAH-031421/ProMeas	FS40	40	7	12	X2	10	11	12	RMP420	AI-15
MA-081235	NO.2 DRAIN PUMP FAULT	MIC-081235/Failure	FS40	40	7	13	X2	14		15	RMP420	DI-01
MI-081235B	NO.2 DRAIN PUMP LOCAL/REMOTE	MIC-081235/Remote	FS40	40	7	14	X2	17		19	RMP420	DI-01
MI-081235A	NO.2 DRAIN PUMP RUNNING	MIC-081235/Running	FS40	40	7	15	X2	20		22	RMP420	DI-01
MC-081235A	NO.2 DRAIN PUMP START	MIC-081235/Start	FS40	40	7	16	X2	23	24		RMP420	DO-01
MC-081235B	NO.2 DRAIN PUMP STOP	MIC-081235/Stop	FS40	40	7	17	X3	1	2		RMP420	DO-01
TIAH-063403	BURNER BOOM S.W. FP WINDING TEMP-R	TIAH-063403/ProMeas	FS40	40	7	18	X3	4	5	6	RMP420	AI-15
TIAH-063404	BURNER BOOM S.W. FP WINDING TEMP-S	TIAH-063404/ProMeas	FS40	40	7	19	X3	7	8	9	RMP420	AI-15
TIAH-063405	BURNER BOOM S.W. FP WINDING TEMP-T	TIAH-063405/ProMeas	FS40	40	7	20	X3	10	11	12	RMP420	AI-15

Loop Typical: DI-01



Exercises

- IO-list
- FS-400C-R1

Summary

- Field Station cabinets
- Cabinet Layout FS-400C-R1
- Cabinet power distribution
- Power alarm
- RBus solution
- IO list
- Loop typical