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NOTES

This list defines the 192 field and inter-system I/O points of the station control systems (185 hardwired), grouped by logic solver: the BPCS remote terminal unit in CP-102A, the safety PLC in CP-102B, flow computer FQI-110 in CP-102C, burner management system BMS-150 in CP-150, and the demarcation panel JB-W01 shared with the receiving pipeline operator. The I/O count summary is the basis for the panel layouts (INS-DWG-005) and the controller datasheets (INS-DS-010 and -011). Alarm values are in INS-LST-003 and interlock actions in INS-LST-004.

Analog inputs are 4-20 mA, two-wire, loop-powered from the input card at 24 VDC, with HART pass-through and NAMUR NE43 fault levels (below 3.6 mA or above 21.0 mA). Analog outputs are 4-20 mA with HART to electric actuator positioners. Discrete inputs are dry contacts wetted at 24 VDC by the card; SIS trip inputs are normally closed and open to trip, with line monitoring where the card supports it, so that a broken wire produces a trip or a diagnostic alarm rather than a hidden failure. Discrete outputs are 24 VDC, 0.5 A; SIS outputs to shutdown valve solenoids de-energize to trip, and interposing relays are used for motor-operated valves and other non-24 V loads. Pulse inputs accept 0 to 10 kHz. Serial ports are RS-485 Modbus RTU, terminated at 120 ohm. Ethernet links carry Modbus TCP, on copper inside a building and on fibre between buildings.

Twenty percent installed spare was added to the used count of each I/O type and rounded up; cards were then selected at the channel density shown, and the remaining channels are additional spare. The safety PLC analog inputs use three 8-channel cards so that PT-133A, PT-133B and PT-133C, the three overpressure shutdown transmitters, each sit on a separate card and no single card failure can remove two votes. Card densities are typical of the product class and will be confirmed with the selected vendor (HOLD H-15). The JB column names the junction box through which the field cable passes; HOME is a direct cable to B-102. The receiving pipeline operator’s point list (HOLD H-14) may change the JB-W01 points.

I/O COUNT SUMMARY

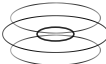
Table 1-1 gives the used, spare and installed channels per system and I/O type, and Table 1-2 the totals per logic solver.

Table 1-1: I/O Count and Card Selection

System	I/O type	Used	Spare 20 %	Required	Ch / card	Cards	Installed ch	Total spare ch
RTU	AI	23	5	28	16	2	32	9
RTU	AO	6	2	8	8	1	8	2
RTU	DI	65	13	78	32	3	96	31
RTU	DO	15	3	18	16	2	32	17
RTU	PI	1	1	2	8	1	8	7
RTU	SER	2	1	3	4	1	4	2
SIS	AI	7	2	9	8	3	24	17
SIS	DI	30	6	36	16	3	48	18
SIS	DO	14	3	17	8	3	24	10
FC	AI	4	1	5	12	1	12	8
FC	PI	4	1	5	4	2	8	4
FC	DO	1	1	2	4	1	4	3
FC	SER	3	1	4	4	1	4	1
FC	ETH	1	1	2	2	1	2	1
BMS	DI	11	3	14	12	2	24	13
BMS	DO	4	1	5	8	1	8	4

Table 1-2: Hardwired I/O Totals

System	Hardwired points used	Required incl. 20 % spare	Installed channels
RTU	110	134	176
SIS	51	62	96
FC	9	12	24

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System	Hardwired points used	Required incl. 20 % spare	Installed channels	
BMS	15	19	32	

BPCS RTU/PLC, CP-102A

The points of BPCS RTU/PLC (CP-102A, B-102) are listed by type in Table 1-3, Table 1-4, Table 1-5, Table 1-6, Table 1-7, Table 1-8, Table 1-9.

Table 1-3: RTU Analog Inputs (23 points)

Point	Device tag	I/O	Description	Range / state	Alarms	P&ID	JB	Signal
PT-101	PT-101	AI	Station inlet pressure	0-2000 psig	H/L/LL, ROC	101	JB-101	4-20 mA HART
PT-102A	PT-102A	AI	PR-101 barrel pressure	0-2000 psig	PAH 5 psig with closure open	101	JB-101	4-20 mA HART
TT-101	TT-101	AI	Station inlet temperature	-20 to 150 F	H/L	101	JB-101	4-20 mA HART
LT-104	LT-104	AI	V-101 sump level	0-30 in	H/L	102	JB-101	4-20 mA HART
PDIT-103	PDIT-103	AI	V-101 filter DP	0-25 psid	L/H/HH	102	JB-101	4-20 mA HART
ZT-104	LCV-104	AI	LCV-104 position feedback	0-100 %	Deviation alarm P2	102	JB-101	4-20 mA HART
AT-142	AT-142	AI	Water vapor	0-20 lb/MMscf	H/HH	104	JB-140	4-20 mA HART
AT-143	AT-143	AI	H2S	0-16 ppmv	H/HH	104	JB-140	4-20 mA HART
AT-144	AT-144	AI	Oxygen	0-100 ppmv	H/HH	104	JB-140	4-20 mA HART
TT-151	TT-151	AI	H-101 bath temperature	0-250 F	H/L	105	JB-150	4-20 mA HART
TT-156	TT-156	AI	Heater gas outlet temperature	-20 to 250 F	H/HH	105	JB-150	4-20 mA HART
FT-163	FT-163	AI	Fuel gas flow	0-8 Mscf/h	H	106	JB-101	4-20 mA HART + pulse
PT-164	PT-164	AI	Fuel gas pressure	0-60 psig	H/L	106	JB-101	4-20 mA HART
PT-134	PT-134	AI	Control valve outlet pressure	0-2000 psig	H/HH/L	107	JB-130	4-20 mA HART
TT-135	TT-135	AI	Control valve outlet temperature	-20 to 150 F	L/LL/H	107	JB-130	4-20 mA HART
ZT-131	FCV-131	AI	FCV-131 position feedback	0-100 %	Deviation alarm P2	107	JB-130	4-20 mA HART
ZT-132	FCV-132	AI	FCV-132 position feedback	0-100 %	Deviation alarm P2	107	JB-130	4-20 mA HART
PT-172	PT-172	AI	Station outlet pressure	0-2000 psig	H/L	108	JB-170	4-20 mA HART
TT-173	TT-173	AI	Delivery temperature	-20 to 150 F	L/LL/H/HH	108	JB-170	4-20 mA HART
LT-191	LT-191	AI	T-101 level	0-96 in	H/HH/L	110	JB-101	4-20 mA HART
ZT-152	TCV-152	AI	TCV-152 position feedback	0-100 %	Deviation alarm P2	112	JB-150	4-20 mA HART
EI-210A	XA-210	AI	24 VDC bus voltage	0-30 VDC	L/LL	113	HOME	Dry contact DI
TT-208A	TT-208A	AI	B-101 temperature	0-150 F	H/L	113	JB-140	4-20 mA HART

Table 1-4: RTU Analog Outputs (6 points)

Point	Device tag	I/O	Description	Range / state	Alarms	P&ID	JB	Signal
LCV-104	LCV-104	AO	LCV-104 position demand	0-100 %	-	102	JB-101	4-20 mA HART
FCV-131	FCV-131	AO	FCV-131 position demand	0-100 %	-	107	JB-130	4-20 mA HART
FCV-132	FCV-132	AO	FCV-132 position demand	0-100 %	-	107	JB-130	4-20 mA HART
FQI-110R	JB-W01	AO	Station flow rate repeat to (isolated)	0-150 MMSCFD	-	111	JB-W01	Hardwired via JB-W01
PT-172R	JB-W01	AO	Outlet pressure repeat to (isolated)	0-2000 psig	-	111	JB-W01	Hardwired via JB-W01
TCV-152	TCV-152	AO	TCV-152 position demand	0-100 %	-	112	JB-150	4-20 mA HART

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Table 1-5: RTU Discrete Inputs (65 points)

Point	Device tag	I/O	Description	Range / state	Alarms	P&ID	JB	Signal
XA-101	SDV-101	DI	SDV-101 EH power unit fault / low hydraulic pressure	0 = fault	Alarm P3	101	JB-101S	24 VDC DO
XS-102	XI-102	DI	Pig arrival at PR-101	1 = pig	Event P4	101	JB-101	Dry contact DI
HS-104R	LCV-104	DI	LCV-104 actuator in remote	1 = remote	-	102	JB-101	4-20 mA HART
XA-104	LCV-104	DI	LCV-104 actuator fault	0 = fault	Alarm P3	102	JB-101	4-20 mA HART
XA-106	SDV-106	DI	SDV-106 EH power unit fault / low hydraulic pressure	0 = fault	Alarm P3	102	JB-101S	24 VDC DO
ZSO-103C	ZSO-103C	DI	V-101 bypass HV-103C not closed	1 = open	Alarm P2	102	JB-101	Dry contact DI
HS-111R	MOV-111	DI	MOV-111 local/remote selector in remote	1 = remote	-	103	JB-110	DI/DO
HS-112R	MOV-112	DI	MOV-112 local/remote selector in remote	1 = remote	-	103	JB-110	DI/DO
HS-115R	MOV-115	DI	MOV-115 local/remote selector in remote	1 = remote	-	103	JB-110	DI/DO
HS-121R	MOV-121	DI	MOV-121 local/remote selector in remote	1 = remote	-	103	JB-110	DI/DO
HS-122R	MOV-122	DI	MOV-122 local/remote selector in remote	1 = remote	-	103	JB-110	DI/DO
XA-110	FQI-110	DI	FQI-110 watchdog / common alarm	0 = fail	Alarm P2	103	HOME	Ethernet / serial
XA-111	MOV-111	DI	MOV-111 actuator fault / monitor relay	0 = fault	Alarm P3	103	JB-110	DI/DO
XA-112	MOV-112	DI	MOV-112 actuator fault / monitor relay	0 = fault	Alarm P3	103	JB-110	DI/DO
XA-115	MOV-115	DI	MOV-115 actuator fault / monitor relay	0 = fault	Alarm P3	103	JB-110	DI/DO
XA-121	MOV-121	DI	MOV-121 actuator fault / monitor relay	0 = fault	Alarm P3	103	JB-110	DI/DO
XA-122	MOV-122	DI	MOV-122 actuator fault / monitor relay	0 = fault	Alarm P3	103	JB-110	DI/DO
ZSC-111	MOV-111	DI	MOV-111 closed limit	1 = closed	-	103	JB-110	DI/DO
ZSC-112	MOV-112	DI	MOV-112 closed limit	1 = closed	-	103	JB-110	DI/DO
ZSC-115	MOV-115	DI	MOV-115 closed limit	1 = closed	-	103	JB-110	DI/DO
ZSC-121	MOV-121	DI	MOV-121 closed limit	1 = closed	-	103	JB-110	DI/DO
ZSC-122	MOV-122	DI	MOV-122 closed limit	1 = closed	-	103	JB-110	DI/DO
ZSO-111	MOV-111	DI	MOV-111 open limit	1 = open	-	103	JB-110	DI/DO
ZSO-112	MOV-112	DI	MOV-112 open limit	1 = open	-	103	JB-110	DI/DO
ZSO-115	MOV-115	DI	MOV-115 open limit	1 = open	-	103	JB-110	DI/DO
ZSO-121	MOV-121	DI	MOV-121 open limit	1 = open	-	103	JB-110	DI/DO
ZSO-122	MOV-122	DI	MOV-122 open limit	1 = open	-	103	JB-110	DI/DO
PSL-141L	PSL-141L	DI	GC carrier gas pressure low	0 = low	Alarm P3	104	JB-140	Dry contact DI
XA-141	AT-141	DI	GC common alarm	0 = alarm	Alarm P2	104	HOME	Ethernet Modbus TCP
XA-142	AT-142	DI	AT-142 fault	0 = fault	Alarm P3	104	JB-140	4-20 mA HART
XA-143	AT-143	DI	AT-143 fault	0 = fault	Alarm P3	104	JB-140	4-20 mA HART
XA-144	AT-144	DI	AT-144 fault	0 = fault	Alarm P3	104	JB-140	4-20 mA HART
XA-146	SMP-146	DI	Sampler cylinder full / fault	0 = alarm	Alarm P3	104	JB-140	DO pulse / DI
XA-150	BMS-150	DI	BMS-150 burner trip (common)	0 = trip	Alarm P2	105	CP-150	Modbus RTU + hardwired
XL-150	BMS-150	DI	BMS-150 main flame proven, release to modulate	1 = released	-	105	CP-150	Modbus RTU + hardwired
ZSC-158C	ZSC-158C	DI	Heater bypass HV-158C closed	1 = closed	-	105	JB-150	Dry contact DI
ZSO-158C	ZSO-158C	DI	Heater bypass HV-158C open	1 = open	-	105	JB-150	Dry contact DI
TSH-161B	TSH-161B	DI	E-161 high element temperature cutout operated	0 = tripped	Alarm P3	106	JB-101	Dry contact DI

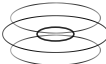
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Point	Device tag	I/O	Description	Range / state	Alarms	P&ID	JB	Signal	
XA-161	XA-161	DI	E-161 common alarm	0 = alarm	Alarm P3	106	JB-101	Dry contact DI	
XA-165	SDV-165	DI	SDV-165 EH power unit fault / low hydraulic pressure	0 = fault	Alarm P3	106	JB-101S	24 VDC DO	
HS-131R	FCV-131	DI	FCV-131 actuator in remote	1 = remote	-	107	JB-130	4-20 mA HART	
HS-132R	FCV-132	DI	FCV-132 actuator in remote	1 = remote	-	107	JB-130	4-20 mA HART	
XA-102	SDV-102	DI	SDV-102 EH power unit fault / low hydraulic pressure	0 = fault	Alarm P3	107	JB-130S	24 VDC DO	
XA-131	FCV-131	DI	FCV-131 actuator fault	0 = fault	Alarm P3	107	JB-130	4-20 mA HART	
XA-132	FCV-132	DI	FCV-132 actuator fault	0 = fault	Alarm P3	107	JB-130	4-20 mA HART	
ZSO-131A	ZSO-131A	DI	HV-131A open	1 = open	-	107	JB-130	Dry contact DI	
ZSO-131B	ZSO-131B	DI	HV-131B open	1 = open	-	107	JB-130	Dry contact DI	
ZSO-132A	ZSO-132A	DI	HV-132A open	1 = open	-	107	JB-130	Dry contact DI	
ZSO-132B	ZSO-132B	DI	HV-132B open	1 = open	-	107	JB-130	Dry contact DI	
XA-103	SDV-103	DI	SDV-103 EH power unit fault / low hydraulic pressure	0 = fault	Alarm P3	108	JB-130S	24 VDC DO	
XS-WIL5	JB-W01	DI	flow permissive (receipt authorised)	1 = permit	-	111	JB-W01	Hardwired via JB-W01	
HS-152R	TCV-152	DI	TCV-152 actuator in remote	1 = remote	-	112	JB-150	4-20 mA HART	
XA-152	TCV-152	DI	TCV-152 actuator fault	0 = fault	Alarm P3	112	JB-150	4-20 mA HART	
XA-209C	XS-209	DI	G-101 generator fault	0 = fault	Alarm P2	113	HOME	Dry contact DI	
XA-210	XA-210	DI	UPS common alarm	0 = alarm	Alarm P2	113	HOME	Dry contact DI	
XA-210B	XA-210	DI	UPS on battery	1 = on batt	Alarm P3	113	HOME	Dry contact DI	
XS-209A	XS-209	DI	Utility power available	1 = normal	Alarm P3	113	HOME	Dry contact DI	
XS-209B	XS-209	DI	ATS on generator	1 = gen	Event P4	113	HOME	Dry contact DI	
XS-209D	XS-209	DI	G-101 running	1 = run	-	113	HOME	Dry contact DI	
ZS-211A	ZS-211	DI	Intrusion B-101 door	0 = open	Alarm P3	113	HOME	Dry contact DI	
ZS-211B	ZS-211	DI	Intrusion B-102 door	0 = open	Alarm P3	113	HOME	Dry contact DI	
ZS-211C	ZS-211	DI	Intrusion main gate	0 = open	Alarm P3	113	HOME	Dry contact DI	
ZS-211D	ZS-211	DI	Intrusion emergency gate	0 = open	Alarm P3	113	HOME	Dry contact DI	
ZS-211E	ZS-211	DI	Intrusion north personnel gate	0 = open	Alarm P3	113	HOME	Dry contact DI	
ZS-211F	ZS-211	DI	Intrusion east personnel gate	0 = open	Alarm P3	113	HOME	Dry contact DI	

Table 1-6: RTU Discrete Outputs (15 points)

Point	Device tag	I/O	Description	Range / state	Alarms	P&ID	JB	Signal
HY-111C	MOV-111	DO	MOV-111 close command	1 = close	-	103	JB-110	DI/DO
HY-111O	MOV-111	DO	MOV-111 open command	1 = open	-	103	JB-110	DI/DO
HY-112C	MOV-112	DO	MOV-112 close command	1 = close	-	103	JB-110	DI/DO
HY-112O	MOV-112	DO	MOV-112 open command	1 = open	-	103	JB-110	DI/DO
HY-115C	MOV-115	DO	MOV-115 close command	1 = close	-	103	JB-110	DI/DO
HY-115O	MOV-115	DO	MOV-115 open command	1 = open	-	103	JB-110	DI/DO
HY-121C	MOV-121	DO	MOV-121 close command	1 = close	-	103	JB-110	DI/DO
HY-121O	MOV-121	DO	MOV-121 open command	1 = open	-	103	JB-110	DI/DO
HY-122C	MOV-122	DO	MOV-122 close command	1 = close	-	103	JB-110	DI/DO
HY-122O	MOV-122	DO	MOV-122 open command	1 = open	-	103	JB-110	DI/DO

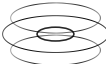
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Point	Device tag	I/O	Description	Range / state	Alarms	P&ID	JB	Signal	
HS-150P	BMS-150	DO	RTU heater enable (heater mode ON)	1 = enable	-	105	CP-150	Modbus RTU + hardwired	
TY-156	TY-156	DO	TT-156 HH burner trip command (de-energize to trip)	0 = trip	-	105	HOME	24 VDC DO / DI	
XY-103Q	XY-103Q	DO	Request SDV-103 close (quality shut-in)	1 = close request	-	108	HOME	24 VDC DO / DI	
XS-WIL3	JB-W01	DO	SDV-103 closed / station not delivering	1 = closed	-	111	JB-W01	Hardwired via JB-W01	
XS-WIL4	JB-W01	DO	Gas quality shut-in in progress	1 = active	-	111	JB-W01	Hardwired via JB-W01	

Table 1-7: RTU Pulse Inputs (1 points)

Point	Device tag	I/O	Description	Range / state	Alarms	P&ID	JB	Signal	
FQ-163	FT-163	PI	Fuel gas totalizer pulse	pulse	-	106	JB-101	4-20 mA HART + pulse	

Table 1-8: RTU Serial Ports (2 points)

Point	Device tag	I/O	Description	Range / state	Alarms	P&ID	JB	Signal	
BMS-150S	BMS-150	SER	BMS-150 status / first-out (Modbus RTU)	RS-485	-	105	CP-150	Modbus RTU + hardwired	
RTU-WIL	JB-W01	SER	RTU Modbus RTU slave port to RTU (HOLD H-14)	RS-485	-	111	JB-W01	Hardwired via JB-W01	

Table 1-9: RTU Ethernet Ports (1 points)

Point	Device tag	I/O	Description	Range / state	Alarms	P&ID	JB	Signal	
FQI-110E1	FQI-110	ETH	FQI-110 to RTU, Modbus TCP (flow, energy, diagnostics)	Ethernet	-	103	HOME	Ethernet / serial	

SAFETY PLC, CP-102B

The points of Safety PLC (CP-102B, B-102) are listed by type in Table 1-10, Table 1-11, Table 1-12.

Table 1-10: SIS Analog Inputs (7 points)

Point	Device tag	I/O	Description	Range / state	Alarms	P&ID	JB	Signal	
PT-133A	PT-133A	AI	OPSS pressure A	0-2000 psig	H / HH trip 2oo3, deviation	107	JB-130S	4-20 mA HART	
PT-133B	PT-133B	AI	OPSS pressure B	0-2000 psig	H / HH trip 2oo3, deviation	107	JB-130S	4-20 mA HART	
PT-133C	PT-133C	AI	OPSS pressure C	0-2000 psig	H / HH trip 2oo3, deviation	107	JB-130S	4-20 mA HART	
BE-213	BE-213	AI	Heater area fire detector	4-20 mA (fire = 20 mA)	Fire P1	111	HOME	4-20 mA	
GD-205	GD-205	AI	B-101 gas detector 1	0-100 % LEL	20 / 40 % LEL	111	JB-140S	4-20 mA (3-wire)	
GD-206	GD-206	AI	B-101 gas detector 2	0-100 % LEL	20 / 40 % LEL	111	JB-140S	4-20 mA (3-wire)	
GD-207	GD-207	AI	B-102 HVAC intake gas	0-100 % LEL	20 / 40 % LEL	111	HOME	4-20 mA (3-wire)	

Table 1-11: SIS Discrete Inputs (30 points)

Point	Device tag	I/O	Description	Range / state	Alarms	P&ID	JB	Signal	
HS-101C	HS-101	DI	SDV-101 local close	0 = close (NC)	-	101	JB-101S	Dry contact DI	
HS-101R	HS-101	DI	SDV-101 local reset / open permissive	1 = reset	-	101	JB-101S	Dry contact DI	
ZSC-101	SDV-101	DI	SDV-101 closed limit	1 = closed	Travel alarm P2	101	JB-101S	24 VDC DO	
ZSO-101	SDV-101	DI	SDV-101 open limit	1 = open	-	101	JB-101S	24 VDC DO	
HS-106R	HS-106	DI	SDV-106 local reset	1 = reset	-	102	JB-101S	Dry contact DI	
LSHH-105	LSHH-105	DI	V-101 level high-high	0 = trip (NC)	Trip P1	102	JB-101S	Dry contact DI	



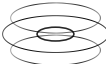
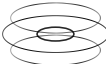
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Point	Device tag	I/O	Description	Range / state	Alarms	P&ID	JB	Signal	
LSLL-106	LSLL-106	DI	V-101 level low-low	0 = trip (NC)	Trip P1	102	JB-101S	Dry contact DI	
ZSC-106	SDV-106	DI	SDV-106 closed limit	1 = closed	Travel alarm P2	102	JB-101S	24 VDC DO	
XS-150	BMS-150	DI	BMS-150 burner trip relay (closes SDV-165, P&ID I-06)	0 = trip (NC)	Trip P2	105	CP-150	Modbus RTU + hardwired	
HS-165R	HS-165	DI	SDV-165 local reset	1 = reset	-	106	JB-101S	Dry contact DI	
ZSC-165	SDV-165	DI	SDV-165 closed limit	1 = closed	Travel alarm P2	106	JB-101S	24 VDC DO	
HS-102C	HS-102	DI	SDV-102 local close	0 = close (NC)	-	107	JB-130S	Dry contact DI	
HS-102R	HS-102	DI	OPSS local key reset	1 = reset	-	107	JB-130S	Dry contact DI	
ZSC-102	SDV-102	DI	SDV-102 closed limit	1 = closed	Travel alarm P2	107	JB-130S	24 VDC DO	
ZSO-102	SDV-102	DI	SDV-102 open limit	1 = open	-	107	JB-130S	24 VDC DO	
HS-103C	HS-103	DI	SDV-103 local close	0 = close (NC)	-	108	JB-130S	Dry contact DI	
HS-103R	HS-103	DI	SDV-103 local reset	1 = reset	-	108	JB-130S	Dry contact DI	
XS-103Q	XY-103Q	DI	BPCS close request for SDV-103	1 = close request	Event P2	108	HOME	24 VDC DO / DI	
ZSC-103	SDV-103	DI	SDV-103 closed limit	1 = closed	Travel alarm P2	108	JB-130S	24 VDC DO	
ZSO-103	SDV-103	DI	SDV-103 open limit	1 = open	-	108	JB-130S	24 VDC DO	
LSHH-192	LSHH-192	DI	T-101 level high-high	0 = trip (NC)	Trip P1	110	JB-101S	Dry contact DI	
FSL-208	FSL-208	DI	B-101 ventilation airflow low	0 = low	Alarm P2	111	JB-140S	Dry contact DI	
HS-200B	HS-200	DI	Maintenance override key (bypass permissive)	1 = enabled	Alarm P3	111	HOME	Dry contact DI	
HS-200R	HS-200	DI	ESD reset (key)	1 = reset	-	111	HOME	Dry contact DI	
HS-201	HS-201	DI	ESD pushbutton main gate	0 = ESD (NC)	Trip P1	111	HOME	Dry contact DI	
HS-202	HS-202	DI	ESD pushbutton B-102	0 = ESD (NC)	Trip P1	111	HOME	Dry contact DI	
HS-203	HS-203	DI	ESD pushbutton meter skid	0 = ESD (NC)	Trip P1	111	HOME	Dry contact DI	
HS-204	HS-204	DI	ESD pushbutton heater	0 = ESD (NC)	Trip P1	111	HOME	Dry contact DI	
HS-215	HS-215	DI	remote shutdown	0 = shutdown (NC)	Trip P1	111	JB-W01	Dry contact DI	
XS-212	XS-212	DI	B-102 smoke	0 = alarm	Alarm P1	111	HOME	Dry contact DI	

Table 1-12: SIS Discrete Outputs (14 points)

Point	Device tag	I/O	Description	Range / state	Alarms	P&ID	JB	Signal
SY-101	SDV-101	DO	SDV-101 solenoid dump valve (energize to hold open)	1 = hold open, 0 = close	-	101	JB-101S	24 VDC DO
HS-104T	LCV-104	DO	LCV-104 SIS force-close input to actuator (energize to close)	1 = close	-	102	JB-101	4-20 mA HART
SY-106	SDV-106	DO	SDV-106 solenoid dump valve (energize to hold open)	1 = hold open, 0 = close	-	102	JB-101S	24 VDC DO
SY-141	SDV-141	DO	SDV-141 solenoid (energize to open)	1 = open	-	104	JB-140S	24 VDC DO
HS-150T	BMS-150	DO	SIS trip to BMS-150 (ESD, de-energize to trip)	1 = permit	-	105	CP-150	Modbus RTU + hardwired
SY-165	SDV-165	DO	SDV-165 solenoid dump valve (energize to hold open)	1 = hold open, 0 = close	-	106	JB-101S	24 VDC DO
SY-102	SDV-102	DO	SDV-102 solenoid dump valve (energize to hold open)	1 = hold open, 0 = close	-	107	JB-130S	24 VDC DO
SY-103	SDV-103	DO	SDV-103 solenoid dump valve (energize to hold open)	1 = hold open, 0 = close	-	108	JB-130S	24 VDC DO
XS-WIL1	JB-W01	DO	Station ESD active to	0 = ESD	-	111	JB-W01	Hardwired via JB-W01
XS-WIL2	JB-W01	DO	OPSS trip (SDV-102 closed) to	0 = trip	-	111	JB-W01	Hardwired via JB-W01
XY-214A	XY-214	DO	Gas / fire beacon B-101	1 = on	-	111	HOME	24 VDC DO
XY-214B	XY-214	DO	ESD / gas beacon + horn B-102	1 = on	-	111	HOME	24 VDC DO
XY-214C	XY-214	DO	B-102 HVAC shutdown + damper close	0 = trip	-	111	HOME	24 VDC DO

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Point	Device tag	I/O	Description	Range / state	Alarms	P&ID	JB	Signal	
XY-214D	XY-214	DO	B-101 non-rated power isolation	0 = trip	-	111	HOME	24 VDC DO	

FLOW COMPUTER FQI-110, CP-102C

The points of Flow computer FQI-110 (CP-102C, B-102) are listed by type in Table 1-13, Table 1-14, Table 1-15, Table 1-16, Table 1-17.

Table 1-13: FC Analog Inputs (4 points)

Point	Device tag	I/O	Description	Range / state	Alarms	P&ID	JB	Signal
PT-111	PT-111	AI	Run 1 static pressure	0-1500 psia	H/L	103	JB-110M	4-20 mA HART
PT-121	PT-121	AI	Run 2 static pressure	0-1500 psia	H/L	103	JB-110M	4-20 mA HART
TT-111	TT-111	AI	Run 1 gas temperature	-20 to 150 F	H/L	103	JB-110M	4-20 mA HART
TT-121	TT-121	AI	Run 2 gas temperature	-20 to 150 F	H/L	103	JB-110M	4-20 mA HART

Table 1-14: FC Discrete Outputs (1 points)

Point	Device tag	I/O	Description	Range / state	Alarms	P&ID	JB	Signal
SY-146	SMP-146	DO	Sampler grab pulse (flow proportional)	pulse	-	104	JB-140	DO pulse / DI

Table 1-15: FC Pulse Inputs (4 points)

Point	Device tag	I/O	Description	Range / state	Alarms	P&ID	JB	Signal
FT-111A	FE-111	PI	USM-1 pulse A	0-5 kHz	-	103	JB-110M	RS-485 Modbus + dual pulse
FT-111B	FE-111	PI	USM-1 pulse B (quadrature)	0-5 kHz	Pulse fidelity	103	JB-110M	RS-485 Modbus + dual pulse
FT-121A	FE-121	PI	USM-2 pulse A	0-5 kHz	-	103	JB-110M	RS-485 Modbus + dual pulse
FT-121B	FE-121	PI	USM-2 pulse B (quadrature)	0-5 kHz	Pulse fidelity	103	JB-110M	RS-485 Modbus + dual pulse

Table 1-16: FC Serial Ports (3 points)

Point	Device tag	I/O	Description	Range / state	Alarms	P&ID	JB	Signal
FQI-110S1	FQI-110	SER	FQI-110 to demarcation, Modbus RTU (HOLD H-14)	RS-485	-	103	HOME	Ethernet / serial
FT-111S	FE-111	SER	USM-1 diagnostics and flow (Modbus RTU)	RS-485	Path fail, SOS dev, SNR	103	JB-110M	RS-485 Modbus + dual pulse
FT-121S	FE-121	SER	USM-2 diagnostics and flow (Modbus RTU)	RS-485	Path fail, SOS dev, SNR	103	JB-110M	RS-485 Modbus + dual pulse

Table 1-17: FC Ethernet Ports (1 points)

Point	Device tag	I/O	Description	Range / state	Alarms	P&ID	JB	Signal
AT-141E	AT-141	ETH	GC composition, HHV, SG to FQI-110 (Modbus TCP, fibre from B-101)	Ethernet	GC fail, cal fail	104	HOME	Ethernet Modbus TCP

BURNER MANAGEMENT SYSTEM BMS-150, CP-150

The points of Burner management BMS-150 (CP-150 at H-101) are listed by type in Table 1-18, Table 1-19.

Table 1-18: BMS Discrete Inputs (11 points)

Point	Device tag	I/O	Description	Range / state	Alarms	P&ID	JB	Signal
LSH-154B	LSH-154B	DI	Bath level high (coil leak)	0 = trip (NC)	Trip	105	CP-150	Dry contact DI
LSL-154	LSL-154	DI	Bath level low	0 = trip (NC)	Trip	105	CP-150	Dry contact DI



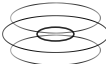
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Point	Device tag	I/O	Description	Range / state	Alarms	P&ID	JB	Signal	
TS-156	TY-156	DI	TT-156 HH trip input to BMS-150 (I-06)	0 = trip (NC)	Trip	105	HOME	24 VDC DO / DI	
TSHH-155	TSHH-155	DI	Bath temperature high-high	0 = trip (NC)	Trip	105	CP-150	Dry contact DI	
BE-153A	BE-153A	DI	Flame detector A	1 = flame	Trip 1oo2	112	CP-150	BMS input	
BE-153B	BE-153B	DI	Flame detector B	1 = flame	Trip 1oo2	112	CP-150	BMS input	
PSH-164B	PSH-164B	DI	Burner fuel pressure high	0 = trip (NC)	Trip	112	CP-150	Dry contact DI	
PSL-164A	PSL-164A	DI	Burner fuel pressure low	0 = trip (NC)	Trip	112	CP-150	Dry contact DI	
ZSC-150A	XV-150A	DI	SSOV 1 proof of closure	1 = closed	-	112	CP-150	24 VDC DO	
ZSC-150B	XV-150B	DI	SSOV 2 proof of closure	1 = closed	-	112	CP-150	24 VDC DO	
ZSL-152	ZSL-152	DI	TCV-152 at low-fire stop	1 = low fire	Permissive	112	CP-150	Dry contact DI	

Table 1-19: BMS Discrete Outputs (4 points)

Point	Device tag	I/O	Description	Range / state	Alarms	P&ID	JB	Signal	
BY-153	BY-153	DO	Igniter	1 = spark	-	112	CP-150	BMS DO	
XV-150A	XV-150A	DO	Main SSOV 1	1 = open	-	112	CP-150	24 VDC DO	
XV-150B	XV-150B	DO	Main SSOV 2	1 = open	-	112	CP-150	24 VDC DO	
XV-150C	XV-150C	DO	Pilot SSOV	1 = open	-	112	CP-150	24 VDC DO	

DEMARCATIOn PANEL JB-W01

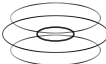
JB-W01 is an Owner-supplied terminal panel at the north fence where the Owner’s and the receiving pipeline operator’s cables terminate on separate, labelled terminal rows through interposing relays and loop isolators. Neither party’s wiring enters the other’s panel, which keeps each party’s control system and its cybersecurity boundary separate. The hardwired points in Table 1-20 are a template pending the operator’s requirements (HOLD H-14); the Modbus point list template is in INS-RPT-002, SCADA, Communications and Cybersecurity. Table 1-21 lists the other system-to-system links.

Table 1-20: Hardwired Points at JB-W01

Point	Owner system	I/O (Owner side)	Description	Range / state	Isolation
RTU-WIL	RTU	SER	RTU Modbus RTU slave port to RTU (HOLD H-14)	RS-485	Relay, loop isolator or RS-485 isolator
XS-WIL1	SIS	DO	Station ESD active to	0 = ESD	Relay, loop isolator or RS-485 isolator
XS-WIL2	SIS	DO	OPSS trip (SDV-102 closed) to	0 = trip	Relay, loop isolator or RS-485 isolator
XS-WIL3	RTU	DO	SDV-103 closed / station not delivering	1 = closed	Relay, loop isolator or RS-485 isolator
XS-WIL4	RTU	DO	Gas quality shut-in in progress	1 = active	Relay, loop isolator or RS-485 isolator
XS-WIL5	RTU	DI	flow permissive (receipt authorised)	1 = permit	Relay, loop isolator or RS-485 isolator
PT-172R	RTU	AO	Outlet pressure repeat to (isolated)	0-2000 psig	Relay, loop isolator or RS-485 isolator
FQI-110R	RTU	AO	Station flow rate repeat to (isolated)	0-150 MMSCFD	Relay, loop isolator or RS-485 isolator
FQI-110S1	FC	SER	Flow computer Modbus RTU to the operator’s RTU	RS-485	RS-485 isolator
HS-215	SIS	DI	Remote shutdown command from the operator (NC contact)	0 = shutdown	Relay

Table 1-21: Inter-System Communications

Link	Between	Protocol / medium	Data
SIS-RTU	Safety PLC to RTU	Modbus TCP, read-only from RTU (SIS write-protected)	Status, trips, first-out, PT-133 values
FC-RTU	FQI-110 to RTU	Modbus TCP	Flow, energy, composition, USM diagnostics, alarms
GC-FC	AT-141 to FQI-110	Modbus TCP (fibre B-101 to B-102)	Composition, HHV, SG, status

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Link	Between	Protocol / medium	Data
USM-FC	FT-111 / FT-121 to FQI-110	Modbus RTU RS-485 (one port each) + pulse	Flow, path diagnostics
BMS-RTU	BMS-150 to RTU	Modbus RTU RS-485	Burner status, first-out, bath temperature
UPS-RTU	UPS to RTU	Modbus TCP (SNMP where offered)	Battery, load, alarms
RTU-WIL	RTU / FQI-110 to RTU	Modbus RTU RS-485 via JB-W01 (HOLD H-14)	Point list template, RPT-002
RTU-SCADA	RTU to Owner SCADA	DNP3 Secure Authentication v5 over cellular VPN (primary), 900 MHz / satellite (secondary)	All points
MOV	MOVs / FCVs	Hardwired (serial fieldbus not used)	-

INSTRUMENT CABLE SCHEDULE

Cable lengths were taken off the routes on INS-DWG-003: the rectilinear route from device to junction box and from junction box to B-102, plus 10 ft for drops, 16 ft for risers, 15 ft inside B-102 and a 10 % routing allowance. Table 1-22 summarizes the 150 cables by type and Table 1-23 lists them.

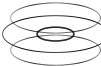
Table 1-22: Instrument Cable by Type

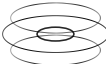
Cable code	Description	Runs	Length (ft)
CC-2C14	Control cable 2/c #14 AWG, 600 V, TC-ER-HL	51	2,410
CC-4C14	Control cable 4/c #14 AWG, 600 V, TC-ER-HL	14	420
CC-7C14	Control cable 7/c #14 AWG, 600 V, TC-ER-HL	6	160
DC-2P22	Data cable 2 pair #22 AWG, individually shielded, 120 ohm, RS-485, TC-ER	9	1,150
FO-06MM	Fibre optic cable 6 strand OM3 50/125 multimode, armoured, outdoor, gel-free	1	230
IC-1P16	Instrument cable 1 pair #16 AWG, twisted, overall shield + drain, 600 V, TC-ER-HL, PVC jacket	39	1,420
IC-1T16	Instrument cable 1 triad #16 AWG, overall shield, 600 V, TC-ER-HL	4	260
MC-12C14	Multiconductor 12/c #14 AWG, overall shield, TC-ER-HL	10	1,030
MC-19C14	Multiconductor 19/c #14 AWG, overall shield, TC-ER-HL	2	460
MC-37C14	Multiconductor 37/c #14 AWG, overall shield, TC-ER-HL	5	880
MP-06P16	Multipair 6 pair #16 AWG, individual + overall shield, TC-ER-HL	6	1,090
MP-12P16	Multipair 12 pair #16 AWG, individual + overall shield, TC-ER-HL	2	390
MP-24P16	Multipair 24 pair #16 AWG, individual + overall shield, TC-ER-HL	1	190

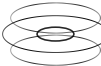
Table 1-23: Instrument Cable Schedule

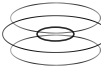
Cable no.	From	To	Type	Length (ft)	Cores / pairs used	Points
C-001	PT-101	JB-101	IC-1P16	30	1	PT-101
C-002	TT-101	JB-101	IC-1P16	29	1	TT-101
C-003	SDV-101	JB-101S	CC-7C14	29	6	SY-101, ZSO-101, ZSC-101
C-004	SDV-101	JB-101	CC-2C14	26	2	XA-101
C-005	HS-101	JB-101S	CC-4C14	34	4	HS-101C, HS-101R
C-006	XI-102	JB-101	CC-2C14	69	2	XS-102
C-007	PT-102A	JB-101	IC-1P16	73	1	PT-102A
C-008	PDIT-103	JB-101	IC-1P16	34	1	PDIT-103
C-009	LT-104	JB-101	IC-1P16	30	1	LT-104
C-010	LCV-104	JB-101	IC-1P16	23	1	LCV-104
C-011	LCV-104	JB-101	IC-1P16	23	1	ZT-104
C-012	LCV-104	JB-101	CC-4C14	23	3	XA-104, HS-104R



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Cable no.	From	To	Type	Length (ft)	Cores / pairs used	Points	
C-013	LCV-104	JB-101S	CC-2C14	20	2	HS-104T	
C-014	LSHH-105	JB-101S	CC-2C14	29	2	LSHH-105	
C-015	LSLL-106	JB-101S	CC-2C14	30	2	LSLL-106	
C-016	SDV-106	JB-101S	CC-4C14	26	4	SY-106, ZSC-106	
C-017	SDV-106	JB-101	CC-2C14	30	2	XA-106	
C-018	HS-106	JB-101S	CC-2C14	22	2	HS-106R	
C-019	ZSO-103C	JB-101	CC-2C14	14	2	ZSO-103C	
C-020	FE-111	JB-110M	IC-1P16	26	1	FT-111A	
C-021	FE-111	JB-110M	IC-1P16	26	1	FT-111B	
C-022	FE-111	JB-110M	DC-2P22	26	1	FT-111S	
C-023	PT-111	JB-110M	IC-1P16	27	1	PT-111	
C-024	TT-111	JB-110M	IC-1P16	24	1	TT-111	
C-025	MOV-111	JB-110	MC-12C14	33	8	ZSO-111, ZSC-111, XA-111, HS-111R, HY-111O, HY-111C	
C-026	MOV-112	JB-110	MC-12C14	41	8	ZSO-112, ZSC-112, XA-112, HS-112R, HY-112O, HY-112C	
C-027	FE-121	JB-110M	IC-1P16	34	1	FT-121A	
C-028	FE-121	JB-110M	IC-1P16	34	1	FT-121B	
C-029	FE-121	JB-110M	DC-2P22	34	1	FT-121S	
C-030	PT-121	JB-110M	IC-1P16	34	1	PT-121	
C-031	TT-121	JB-110M	IC-1P16	33	1	TT-121	
C-032	MOV-121	JB-110	MC-12C14	42	8	ZSO-121, ZSC-121, XA-121, HS-121R, HY-121O, HY-121C	
C-033	MOV-122	JB-110	MC-12C14	50	8	ZSO-122, ZSC-122, XA-122, HS-122R, HY-122O, HY-122C	
C-034	MOV-115	JB-110	MC-12C14	26	8	ZSO-115, ZSC-115, XA-115, HS-115R, HY-115O, HY-115C	
C-035	FQI-110	B-102	CC-2C14	16	2	XA-110	
C-036	FQI-110	B-102	DC-2P22	16	1	FQI-110S1	
C-037	B-101	B-102 TR-102	FO-06MM	230	2	AT-141E (also B-101 LAN)	
C-038	AT-141	B-102	CC-2C14	223	2	XA-141	
C-039	AT-142	JB-140	IC-1P16	22	1	AT-142	
C-040	AT-142	JB-140	CC-2C14	22	2	XA-142	
C-041	AT-143	JB-140	IC-1P16	22	1	AT-143	
C-042	AT-143	JB-140	CC-2C14	22	2	XA-143	
C-043	AT-144	JB-140	IC-1P16	22	1	AT-144	
C-044	AT-144	JB-140	CC-2C14	22	2	XA-144	
C-045	SMP-146	JB-140	CC-2C14	24	2	SY-146	
C-046	SMP-146	JB-140	CC-2C14	24	2	XA-146	
C-047	PSL-141L	JB-140	CC-2C14	22	2	PSL-141L	
C-048	SDV-141	JB-140S	CC-2C14	15	2	SY-141	
C-049	TT-151	JB-150	IC-1P16	40	1	TT-151	
C-050	TCV-152	JB-150	IC-1P16	61	1	TCV-152	
C-051	TCV-152	JB-150	IC-1P16	61	1	ZT-152	
C-052	TCV-152	JB-150	CC-4C14	61	3	XA-152, HS-152R	

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Cable no.	From	To	Type	Length (ft)	Cores / pairs used	Points	
C-053	ZSL-152	CP-150	CC-2C14	25	2	ZSL-152	
C-054	BMS-150	CP-150	CC-7C14	14	5	XA-150, XL-150, HS-150P	
C-055	BMS-150	CP-150	DC-2P22	14	1	BMS-150S	
C-056	BMS-150	CP-150	CC-4C14	14	4	XS-150, HS-150T	
C-057	BE-153A	CP-150	CC-2C14	30	2	BE-153A	
C-058	BE-153B	CP-150	CC-2C14	31	2	BE-153B	
C-059	BY-153	CP-150	CC-2C14	29	2	BY-153	
C-060	XV-150A	CP-150	CC-4C14	24	4	XV-150A, ZSC-150A	
C-061	XV-150B	CP-150	CC-4C14	24	4	XV-150B, ZSC-150B	
C-062	XV-150C	CP-150	CC-2C14	25	2	XV-150C	
C-063	LSL-154	CP-150	CC-2C14	54	2	LSL-154	
C-064	LSH-154B	CP-150	CC-2C14	56	2	LSH-154B	
C-065	TSHH-155	CP-150	CC-2C14	52	2	TSHH-155	
C-066	TT-156	JB-150	IC-1P16	21	1	TT-156	
C-067	TY-156	B-102	CC-2C14	16	2	TY-156	
C-068	TY-156	B-102	CC-2C14	16	2	TS-156	
C-069	ZSO-158C	JB-150	CC-2C14	49	2	ZSO-158C	
C-070	ZSC-158C	JB-150	CC-2C14	49	2	ZSC-158C	
C-071	PSL-164A	CP-150	CC-2C14	23	2	PSL-164A	
C-072	PSH-164B	CP-150	CC-2C14	23	2	PSH-164B	
C-073	FT-163	JB-101	IC-1P16	61	1	FT-163	
C-074	FT-163	JB-101	IC-1P16	61	1	FQ-163	
C-075	PT-164	JB-101	IC-1P16	65	1	PT-164	
C-076	SDV-165	JB-101S	CC-4C14	64	4	SY-165, ZSC-165	
C-077	SDV-165	JB-101	CC-2C14	68	2	XA-165	
C-078	HS-165	JB-101S	CC-2C14	59	2	HS-165R	
C-079	TSH-161B	JB-101	CC-2C14	58	2	TSH-161B	
C-080	XA-161	JB-101	CC-2C14	58	2	XA-161	
C-081	FCV-131	JB-130	IC-1P16	28	1	FCV-131	
C-082	FCV-131	JB-130	IC-1P16	28	1	ZT-131	
C-083	FCV-131	JB-130	CC-4C14	28	3	XA-131, HS-131R	
C-084	FCV-132	JB-130	IC-1P16	19	1	FCV-132	
C-085	FCV-132	JB-130	IC-1P16	19	1	ZT-132	
C-086	FCV-132	JB-130	CC-4C14	19	3	XA-132, HS-132R	
C-087	ZSO-131A	JB-130	CC-2C14	29	2	ZSO-131A	
C-088	ZSO-131B	JB-130	CC-2C14	34	2	ZSO-131B	
C-089	ZSO-132A	JB-130	CC-2C14	20	2	ZSO-132A	
C-090	ZSO-132B	JB-130	CC-2C14	25	2	ZSO-132B	
C-091	PT-133A	JB-130S	IC-1P16	31	1	PT-133A	
C-092	PT-133B	JB-130S	IC-1P16	30	1	PT-133B	

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Cable no.	From	To	Type	Length (ft)	Cores / pairs used	Points			
C-093	PT-133C	JB-130S	IC-1P16	29	1	PT-133C			
C-094	SDV-102	JB-130S	CC-7C14	25	6	SY-102, ZSO-102, ZSC-102			
C-095	SDV-102	JB-130	CC-2C14	62	2	XA-102			
C-096	HS-102	JB-130S	CC-4C14	19	4	HS-102C, HS-102R			
C-097	PT-134	JB-130	IC-1P16	38	1	PT-134			
C-098	TT-135	JB-130	IC-1P16	51	1	TT-135			
C-099	XY-103Q	B-102	CC-2C14	16	2	XY-103Q			
C-100	XY-103Q	B-102	CC-2C14	16	2	XS-103Q			
C-101	SDV-103	JB-130S	CC-7C14	55	6	SY-103, ZSO-103, ZSC-103			
C-102	SDV-103	JB-130	CC-2C14	91	2	XA-103			
C-103	HS-103	JB-130S	CC-4C14	48	4	HS-103C, HS-103R			
C-104	PT-172	JB-170	IC-1P16	26	1	PT-172			
C-105	TT-173	JB-170	IC-1P16	29	1	TT-173			
C-106	LT-191	JB-101	IC-1P16	140	1	LT-191			
C-107	LSHH-192	JB-101S	CC-2C14	141	2	LSHH-192			
C-108	HS-201	B-102	CC-2C14	85	2	HS-201			
C-109	HS-202	B-102	CC-2C14	36	2	HS-202			
C-110	HS-203	B-102	CC-2C14	262	2	HS-203			
C-111	HS-204	B-102	CC-2C14	179	2	HS-204			
C-112	HS-200	B-102	CC-4C14	16	4	HS-200R, HS-200B			
C-113	GD-205	JB-140S	IC-1T16	20	1	GD-205			
C-114	GD-206	JB-140S	IC-1T16	21	1	GD-206			
C-115	GD-207	B-102	IC-1T16	44	1	GD-207			
C-116	FSL-208	JB-140S	CC-2C14	25	2	FSL-208			
C-117	TT-208A	JB-140	IC-1P16	24	1	TT-208A			
C-118	XS-209	B-102	CC-7C14	16	5	XS-209A, XS-209B, XA-209C, XS-209D			
C-119	XA-210	B-102	IC-1P16	16	1	EI-210A			
C-120	XA-210	B-102	CC-4C14	16	3	XA-210, XA-210B			
C-121	ZS-211	B-102	CC-7C14	16	7	ZS-211A, ZS-211B, ZS-211C, ZS-211D, ZS-211E, ZS-211F			
C-122	XS-212	B-102	CC-2C14	16	2	XS-212			
C-123	BE-213	B-102	IC-1T16	167	1	BE-213			
C-124	HS-215	JB-W01	CC-2C14	11	2	HS-215			
C-125	XY-214	B-102	MC-12C14	36	8	XY-214A, XY-214B, XY-214C, XY-214D			
C-126	CP-150	B-102	MC-12C14	152	10	homerun, discrete			
C-127	CP-150	B-102	DC-2P22	152	1	homerun, serial			
C-128	JB-101	B-102	MP-24P16	183	11	homerun, 11 pairs used			
C-129	JB-101	B-102	MC-37C14	183	21	homerun, discrete			
C-130	JB-101S	B-102	MC-37C14	179	36	homerun, discrete			
C-131	JB-110	B-102	MC-37C14	237	37	homerun, discrete			
C-132	JB-110	B-102	MC-12C14	237	11	homerun, discrete			

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Cable no.	From	To	Type	Length (ft)	Cores / pairs used	Points	
C-133	JB-110M	B-102	MP-12P16	230	8	homerun, 8 pairs used	
C-134	JB-110M	B-102	DC-2P22	230	1	homerun, serial	
C-135	JB-110M	B-102	DC-2P22	230	1	homerun, serial	
C-136	JB-130	B-102	MP-12P16	156	6	homerun, 6 pairs used	
C-137	JB-130	B-102	MC-37C14	156	22	homerun, discrete	
C-138	JB-130S	B-102	MP-06P16	122	3	homerun, 3 pairs used	
C-139	JB-130S	B-102	MC-37C14	122	24	homerun, discrete	
C-140	JB-140	B-102	MP-06P16	229	4	homerun, 4 pairs used	
C-141	JB-140	B-102	MC-19C14	229	15	homerun, discrete	
C-142	JB-140S	B-102	MP-06P16	226	2	homerun, 2 pairs used	
C-143	JB-140S	B-102	MC-12C14	226	5	homerun, discrete	
C-144	JB-150	B-102	MP-06P16	185	4	homerun, 4 pairs used	
C-145	JB-150	B-102	MC-12C14	185	9	homerun, discrete	
C-146	JB-170	B-102	MP-06P16	102	2	homerun, 2 pairs used	
C-147	JB-W01	B-102	MP-06P16	223	2	homerun, 2 pairs used	
C-148	JB-W01	B-102	MC-19C14	223	15	homerun, discrete	
C-149	JB-W01	B-102	DC-2P22	223	1	homerun, serial	
C-150	JB-W01	B-102	DC-2P22	223	1	homerun, serial	