CAM-Robot Protocol Appendix
Berlin Akribis

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Critical Input Bitmap - PNP

Bit	Type	Hardware	Low "0"	High "1"
0	General	E-Stop	E-Stopped	Normal
1		Air Pressure	Low	Normal
2		Door Closed	Open	Closed
3	-	Reserved	-	-
4		Reserved	-	-
5		Reserved	-	-
6		Reserved	-	-
7		Reserved	-	-
8	Y Gripper	Y (Transfer) Gripper Cylinder	Close	Open
9		Y (Transfer) Gripper Part Present Sensor	Absent	Present
10		Y (Transfer) Gripper Z Up	No	Yes
11		Y (Transfer) Gripper Z Down	No	Yes
12		Y (Transfer) Gripper Vacuum	Off	On
13		Reserved	-	-
14	Elevator	Elevator Shuttle Extended	No	Yes
15		Elevator Shuttle Retracted	No	Yes
16		Elevator Shuttle Part Present Sensor	Absent	Present
17		Reserved	-	-
18	SAC	NG Nest 1 Part Present	Absent	Present
19		NG Nest 2 Part Present	Absent	Present
20		NG Nest 3 Part Present	Absent	Present
21		NG Nest 4 Part Present	Absent	Present
22		NG Nest 5 Part Present	Absent	Present
23	-	Reserved	-	-
24		Reserved	-	-
25	Shuttle	Input Shuttle Ready for PNP Load	Not Ready	Ready
26		Output Shuttle Ready for PNP Unload	Not Ready	Ready
27	-	Reserved	-	-

Bit	Type	Hardware	Low "0"	High "1"
28	-	Reserved	-	-

Critical Output Bitmap - PNP

Bit	Type	Hardware	Low "0"	High "1"
0	EOAT	Reserved	-	-
1		Reserved	-	-
2		Y (Transfer) Gripper Cylinder	Close	Open
3		Y (Transfer) Gripper Vacuum	Off	On
4		Y (Transfer) Gripper Z	Up	Down
5	Shuttle	Elevator Shuttle	Retract	Extend
6		Reserved	-	-
7		Reserved	-	-
8	General	Door Access Indicator Light	Close	Open
9		Light Tower Red*	Absent	Present
10		Light Tower Yellow*	Close	Open
11		Light Tower Green*	Absent	Present
12		Light Tower Beacon*	Close	Open
13		Reserved	-	-
14		Reserved	-	-
15		Reserved	-	-

* Light Tower states should be changed by BEACON command, SET_IO will not work on these critical outputs.

Critical Input Bitmap - VWB

Bit	Type	Hardware	Low "0"	High "1"
0		E-Stop	E-Stopped	Normal
1	General	Air Pressure	Low	Normal
2		Door Closed	Open	Closed
3		Reserved	-	-
4		Reserved	-	-
5	-	Reserved	-	-
6		Reserved	-	-
7		Reserved	-	-
8		Gripper 1 Cylinder	Close	Open
9		Gripper 1 Part Present Sensor	Absent	Present
10		Gripper 2 Cylinder	Close	Open
11		Gripper 2 Part Present Sensor	Absent	Present
12		Gripper 3 Cylinder	Close	Open
13	EOAT	Gripper 3 Part Present Sensor	Absent	Present
14		Gripper 4 Cylinder	Close	Open
15		Gripper 4 Part Present Sensor	Absent	Present
16		Gripper 5 Cylinder	Close	Open
17		Gripper 5 Part Present Sensor	Absent	Present
18	Shuttle	Input Shuttle Ready for VWB Unload	Not Ready	Ready
19		Output Shuttle Ready for VWB Load	Not Ready	Ready
20		Reserved	-	-
21		Reserved	-	-
22		Reserved	-	-
23		Reserved	-	-
24	-	Reserved	-	-
25		Reserved	-	-
26		Reserved	-	-
27		Reserved	-	-

Bit	Type	Hardware	Low "0"	High "1"
28		Reserved	-	-

Critical Output Bitmap - VWB

Bit	Type	Hardware	Low "0"	High "1"
0		Reserved	-	-
1		Reserved	-	-
2		Gripper 1 Cylinder	Close	Open
3	EOAT	Reserved	-	-
4		Gripper 2,3,4 Cylinder	Close	Open
5		Reserved	-	-
6		Gripper 5 Cylinder	Close	Open
7		Reserved	-	-
8	Shuttle	Input Shuttle	Retract	Extend
9		Output Shuttle	Retract	Extend
10		Reserved	-	-
11		Reserved	-	-
12		Reserved	-	-
13		Reserved	-	-
14		Reserved	-	-
15		Reserved	-	-