

T(Robot) -> O(PLC)

bit	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Group
0	ControlBox Digital Input 1-16																ControlBox Digital Output 1-16																I/O
4	AIO type(In0, In1, Out0, ...)				Reserved																												
8	Analog Input 0 (float)																																
12	Analog Input 1 (float)																																
16	Analog Output 0 (float)																																
20	Analog Output 1 (float)																																
24	Tool Digital Input				Reserved								Tool Digital Output				Reserved								Robot								
28	Controller Major Version								Controller Minor Version								Controller Patch Version				Reserved												
32	Robot State								Reserved								SO	SS	ES	DTBP	PBP	Reserved											
36	Joint 1 Position [degree]																												Joint				
40	Joint 2 Position [degree]																																
44	Joint 3 Position [degree]																																
48	Joint 4 Position [degree]																																
52	Joint 5 Position [degree]																																
56	Joint 6 Position [degree]																																
60	Joint 1 Velocity [degree/sec]																																
64	Joint 2 Velocity [degree/sec]																																
68	Joint 3 Velocity [degree/sec]																																
72	Joint 4 Velocity [degree/sec]																																
76	Joint 5 Velocity [degree/sec]																																
80	Joint 6 Velocity [degree/sec]																																
84	Joint 1 Motor Current [A]																																
88	Joint 2 Motor Current [A]																																
92	Joint 3 Motor Current [A]																																
96	Joint 4 Motor Current [A]																																
100	Joint 5 Motor Current [A]																																
104	Joint 6 Motor Current [A]																																
108	Joint 1 Motor Temperature [°C]																																
112	Joint 2 Motor Temperature [°C]																																
116	Joint 3 Motor Temperature [°C]																																
120	Joint 4 Motor Temperature [°C]																																
124	Joint 5 Motor Temperature [°C]																																
128	Joint 6 Motor Temperature [°C]																																
132	Joint 1 Torque [Nm]																																
136	Joint 2 Torque [Nm]																																
140	Joint 3 Torque [Nm]																																
144	Joint 4 Torque [Nm]																																
148	Joint 5 Torque [Nm]																																
152	Joint 6 Torque [Nm]																																
156	Joint 1 External Torque [Nm]																																
160	Joint 2 External Torque [Nm]																																
164	Joint 3 External Torque [Nm]																																
168	Joint 4 External Torque [Nm]																																
172	Joint 5 External Torque [Nm]																																
176	Joint 6 External Torque [Nm]																																

bit	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Group
180	Task Position X [mm] (in base frame)																															TCP	
184	Task Position Y [mm] (in base frame)																																
188	Task Position Z [mm] (in base frame)																																
192	Task Orientation A [degree] (in base frame)																																
196	Task Orientation B [degree] (in base frame)																																
200	Task Orientation C [degree] (in base frame)																																
204	Task Velocity X [mm/sec] (in base frame)																																
208	Task Velocity Y [mm/sec] (in base frame)																																
212	Task Velocity Z [mm/sec] (in base frame)																																
216	Task Angular Velocity RX [degree/sec] (in base frame)																																
220	Task Angular Velocity RY [degree/sec] (in base frame)																																
224	Task Angular Velocity RZ [degree/sec] (in base frame)																																
228	Tool Offset Length X [mm] (in tool frame)																																
232	Tool Offset Length Y [mm] (in tool frame)																																
236	Tool Offset Length Z [mm] (in tool frame)																																
240	Tool Offset Degree A [degree] (in tool frame)																																
244	Tool Offset Degree B [degree] (in tool frame)																																
248	Tool Offset Degree C [degree] (in tool frame)																																
252	Task External Force X [N] (in base frame)																																
256	Task External Force Y [N] (in base frame)																																
260	Task External Force Z [N] (in base frame)																																
264	Task External Moment X [Nm] (in base frame)																																
268	Task External Moment Y [Nm] (in base frame)																																
272	Task External Moment Z [Nm] (in base frame)																																
276	Bit Output Register 0-31																																Bit Registers
280	Bit Output Register 32-64																																

\* A-B-C notation means Euler Z-Y-Z



**Robot State information**

EMERGENCY STOP = 0	The emergency stop state.
INITIALIZING=1	The initialization state for setting various parameters.
SAFE OFF=2	The servo off state. This is robot stop state due to a function error or operation error.
INTERRUPTED=3	The system is in a protective stop state due to protective stop input, exceeding the safety threshold, etc.
MANUAL STANDBY=4	This is the default status of teaching.
MANUAL JOGGING=5	The jog function is used to operate the robot.
MANUAL HANDGUIDING=6	The robot can be operated manually during teaching.
RECOVERY STANDBY=7	Recovery in progress. All safety functions except for axis and TCP speed monitoring are disabled during recovery.
RECOVERY JOGGING=8	The jogs of each axis can be used to correct the exceeded safety threshold.
BACKDRIVE HOLD=9	All brakes of 6 joints are engaged, and Backdrive motion is locked.
BACKDRIVE RELEASE=10	Break of one or more joint(s) is released due to the selection of brake release.
BACKDRIVE RELEASE by COCKPIT=11	Break of one or more joint(s) is released due to the Cockpit.
RECOVERY HANDGUIDING=12	The robot can be moved directly by hand to correct the exceeded safety threshold.
STANDALONE STANDBY=13	The Teach Pendant UI is in the actual mode execution screen in a single work space.. White is displayed for a Standalone Zone
STANDALONE RUNNING=14	The task program is being executed. White is displayed for a Standalone Zone
COLLABORATIVE STANDBY=15	The Teach Pendant UI is in the actual mode execution screen in a single work space.. Green is displayed for a Collaborative Zone..
COLLABORATIVE RUNNING=16	The task program is being executed. Green is displayed for a Collaborative Zone
HIGH PRIORITY RUNNING=17	The task program is being executed. White and Yellow are displayed by turns for a High Priority Zone
AUTO MEASURE=18	The weight and center of gravity point of the end effector are measured automatically.
HANDGUIDING CONTROL STANDBY=19	The Handguiding command is executed during task program execution.
HANDGUIDING CONTROL RUNNING=20	The robot pose can be changed by pressing the "Handguiding" button.

SO = SERVO_ON_ROBOT
SS = SAFETY_STOPPED
ES = EMERGENCY_STOPPED
DTBP = DIRECT_TEACH_BUTTON_PRESSED
PBP = POWER_BUTTON_PRESSED

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0	ControlBox Digital Output 1-16																Tool Digital Output				Reserved	AO type		Reserved					I/O				
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