

1. Controller connect/disconnect

Function name	Description	Parameter	Parameter Description	in/out	Corresponding CAO function (*1)	Notes
nrc_Connect	Connect to a NetwoRC controller.	char *pConnection, long ITimeout, char *pOption	Connection string Time-out Option string	in in in	CaoWorkspace::AddController	
nrc_Disconnect	Disconnect from the controller.				CaoController::Release	

2. Controller status

Function name	Description	Parameter	Parameter Description	in/out	Corresponding CAO function (*1)	Notes
nrc_get_RomVersion	Retrieve a ROM version	char *szVersion, long sizeBuf	Pointer of a buffer Size of the buffer	out in	CaoController::AddVariable("@VERSION")	
nrc_get_SerialNo	Retrieve a serial number	char *szSerialNo, long sizeBuf	Pointer of a buffer Size of the buffer	out in	CaoController::AddVariable("@SERIAL_NO")	
nrc_get_RobotType	Retrieve a robot type	char *szRobotType, long sizeBuf	Pointer of a buffer Size of the buffer	out in	CaoRobot::AddVariable("@TYPE")	
nrc_get_OperationMode	Retrieve an operation mode	long *IMode	Current operation mode	out	CaoController::AddVariable("@MODE")	
nrc_get_AutoEnable	Retrieve an Auto-enable state	long *IAutoEnable	Current Auto-enable state	out	CaoController::Execute("GETSTATUS")	
nrc_get_ProtectiveStop	Retrieve a Protective-stop state	long *IProtectiveStop	Current Protective-stop state	out	CaoController::Execute("GETSTATUS")	Same as nrc_AutoEnable
nrc_get_DeadmanSwitch	Retrieve a Deadman switch state	long *IDeadman	Current Deadman switch state	out	CaoController::Execute("GETSTATUS")	
nrc_get_EmergencyStop	Retrieve a Emergency-stop state	long *IEmergency	Current a Emergency-stop state	out	CaoController::AddVariable("@EMERGENCY_STOP")	
nrc_put_AutoMode	Set an automatic mode	long IAutoMode	Automatic mode (Internal or External)	in	CaoController::Execute("PUTAUTOMODE")	
nrc_get_AutoMode	Retrieve an automatic mode	long *IAutoMode	Current automatic mode	out	CaoController::AddVariable("@MODE")	
nrc_put_MotorState	Set a motor state	long IState	Motor state	in	CaoRobot::Execute("PUTMOTOR")	
nrc_get_MotorState	Retrieve a motor state	long *IState	Current motor state	out	CaoController::AddVariable("@SERVO_ON")	

3. Configuration (CNF)

Function name	Description	Parameter	Parameter Description	in/out	Corresponding CAO function (*1)	Notes
nrc_get_CnfData	Retrieve xxx_CNF data	char *pCnfName, long IParamNo, long *IParamValue	CNF table name Parameter number (Index) Parameter value	in in out	CaoController::AddVariable()	
nrc_put_CnfData	Set xxx_CNF data	char *pCnfName, long IParamNo, long IParamValue	CNF table name Parameter number (Index) Parameter value	in in in	CaoController::AddVariable()	
nrc_get_CalData	Retrieve CALSET data	float *fJnt	CALSET data (6-axis)	out	CaoController::AddVariable("_ARM60")	Part of ARM_CNF data
nrc_put_CalData	Set CALSET data	float *fJnt	CALSET data (6-axis)	in	CaoController::AddVariable("_ARM60")	Part of ARM_CNF data
nrc_get_LinkParam	Retrieve link parameters	float *fLinkSJnt, float *fLinkAJnt	Link parameter S (6-axis) Link parameter A (6-axis)	out	CaoController::AddVariable("_ARM88") CaoController::AddVariable("_ARM94")	Part of ARM_CNF data
nrc_put_LinkParam	Set link parameters	float *fLinkSJnt, float *fLinkAJnt	Link parameter S (6-axis) Link parameter A (6-axis)	in	CaoController::AddVariable("_ARM88") CaoController::AddVariable("_ARM94")	Part of ARM_CNF data
nrc_Calibrate	Calibrate CALSET data and link parameter	float *fRotDiff, float *fLenDiff	Differences of Rotation (6-axis) Differences of Length (6-axis)	in in	-	

4. Error

Function name	Description	Parameter	Parameter Description	in/out	Corresponding CAO function (*1)	Notes
nrc_get_ErrorCode	Retrieve the current error code	long *IErrorCode	Error code	out	CaoController::AddVariable("@ERROR_CODE")	
nrc_get_ErrorDescription	Retrieve the current error description	char *szError, long sizeBuf	Pointer of a buffer Size of the buffer	out in	CaoController::AddVariable("@ERROR_DESCRIPTOR")	
nrc_ClearError	Clear the error	long IErrorCode	Error code	in	CaoController::Execute("CLEARERROR")	

5. Speed

Function name	Description	Parameter	Parameter Description	in/out	Corresponding CAO function (*1)	Notes
nrc_get_Speed	Retrieve an internal speed	float *fSpeed	Internal speed	out	CaoRobot::AddVariable("@SPEED")	
nrc_get_ExtSpeed	Retrieve an external speed	float *fExtSpeed	External speed	out	CaoRobot::AddVariable("@EXTSPEED")	
nrc_put_Speed	Set an internal speed	float fSpeed	Internal speed	in	CaoRobot::Speed()	
nrc_put_ExtSpeed	Set an external speed	float fExtSpeed	External speed	in	CaoRobot::Execute("EXTSPEED")	

6. Robot motion

Function name	Description	Parameter	Parameter Description	in/out	Corresponding CAO function (*1)	Notes
nrc_get_CurrentP	Retrieve the current pose (P)	float *fPosition	P data	out	CaoRobot::AddVariable("@CURRENT_POSITION")	
nrc_get_CurrentJ	Retrieve the current pose (J)	float *fJnt	J data	out	CaoRobot::AddVariable("@CURRENT_ANGLE")	
nrc_get_CurrentT	Retrieve the current pose (T)	float *fTrans	T data	out	CaoRobot::AddVariable("@CURRENT_TRANS")	
nrc_MoveP	Move by P data	long IComp, char *pPath, float *fPosition, char *pOption	Interpolation (0:PTP, 1:CP, ...) Pose accuracy (@P, @E, ...) Destination pose Option string	in in in in	CaoRobot::Move()	

nrc_MoveJ	Move by J data	long lComp, char *pPath, float *fJnt, char *pOption	Interpolation (0:PTP, 1:CP, ...) Pose accuracy (@P, @E, ...) Destination pose Option string	in in in in	CaoRobot::Move()	
nrc_MoveT	Move by T data	long lComp, char *pPath, float *fTrans, char *pOption	Interpolation (0:PTP, 1:CP, ...) Pose accuracy (@P, @E, ...) Destination pose Option string	in in in in	CaoRobot::Move()	
nrc_ApproachP	Approach by P data	long lComp, float *fPosition, char *pPath, float fApproachlen, char *pOption	Interpolation (0:PTP, 1:CP, ...) Destination pose Pose accuracy (@P, @E, ...) Distance from the destination Option string	in in in in	CaoRobot::Execute("APPROACH")	
nrc_ApproachJ	Approach by J data	long lComp, float *fJoint, char *pPath, float fApproachlen, char *pOption	Interpolation (0:PTP, 1:CP, ...) Destination pose Pose accuracy (@P, @E, ...) Distance from the destination Option string	in in in in	CaoRobot::Execute("APPROACH")	
nrc_ApproachT	Approach by T data	long lComp, float *fTrans, char *pPath, float fApproachlen, char *pOption	Interpolation (0:PTP, 1:CP, ...) Destination pose Pose accuracy (@P, @E, ...) Distance from the destination Option string	in in in in	CaoRobot::Execute("APPROACH")	
nrc_Depart	Depart	long lComp, char *pPath, float fDepartlen, char *pOption	Interpolation (0:PTP, 1:CP, ...) Pose accuracy (@P, @E, ...) Distance from the current pose Option string	in in in in	CaoRobot::Execute("DEPART")	
nrc_DriveA	Absolute drive	char *pPath, float *fJnt, char *pOption	Pose accuracy (@P, @E, ...) Absolute destination pose Option string	in in in	CaoRobot::Execute("DRIVEAEX")	
nrc_Drive	Relative drive	char *pPath, float *fJnt, char *pOption	Pose accuracy (@P, @E, ...) Relative destination pose Option string	in in in	CaoRobot::Execute("DRIVEEX")	
nrc_get_MotionState	Retrieve a motion state	long *lState	Motion state	out	CaoRobot::AddVariable("@BUSY_STATUS")	

7. Tool/Work/Area

Function name	Description	Parameter	Parameter Description	in/out	Corresponding CAO function (*1)	Notes
nrc_get_CurTool	Retrieve the current tool number	long *lTool	Tool number	out	CaoRobot::AddVariable("@CURRENT_TOOL")	
nrc_get_CurWork	Retrieve the current work number	long *lWork	Work number	out	CaoRobot::AddVariable("@CURRENT_WORK")	
nrc_put_CurTool	Change the current tool number	long lTool	Tool number	in	CaoRobot::Change("TOOL*")	
nrc_put_CurWork	Change the current work number	long lWork	Work number	in	CaoRobot::Change("WORK*")	
nrc_get_ToolDef	Retrieve a tool definition	long lTool, float *fPos	Tool number Tool definition (P)	in out	CaoController::AddVariable("TOOL*")	
nrc_get_WorkDef	Retrieve a work definition	long lWork, float *fPos	Work number Work definition (P)	in out	CaoController::AddVariable("WORK*")	
nrc_get_AreaDef	Retrieve an area definition	long lWork, float *fArea	Area number Area definition	in out	CaoController::AddVariable("AREA*")	
nrc_put_ToolDef	Define a tool coordinate	long lTool, float *fPos	Tool number Tool definition (P)	in in	CaoController::AddVariable("TOOL*")	
nrc_put_WorkDef	Define a work coordinate	long lWork, float *fPos	Work number Work definition (P)	in in	CaoController::AddVariable("WORK*")	
nrc_put_AreaDef	Define an area	long lArea, float *fArea	Area number Area definition	in in	CaoController::AddVariable("AREA*")	

8. Variable and I/O

Function name	Description	Parameter	Parameter Description	in/out	Corresponding CAO function (*1)	Notes
nrc_get_VarI	Retrieve the current value	long lNo, long *lValue	Variable number (Index) Value	in out	CaoController::AddVariable("@I*")	
nrc_get_VarF	Retrieve the current value	long lNo, float *fValue	Variable number (Index) Value	in out	CaoController::AddVariable("@F*")	
nrc_get_VarD	Retrieve the current value	long lNo, double *dValue	Variable number (Index) Value	in out	CaoController::AddVariable("@D*")	
nrc_get_VarS	Retrieve the current value	long lNo, char *szString, long sizeBuf	Variable number (Index) Value	in out in	CaoController::AddVariable("@S*")	
nrc_get_VarV	Retrieve the current value	long lNo, float *fVec	Variable number (Index) Value	in out	CaoController::AddVariable("@V*")	
nrc_get_VarP	Retrieve the current value	long lNo, float *fPosition	Variable number (Index) Value	in out	CaoController::AddVariable("@P*")	

nrc_get_VarJ	Retrieve the current value	long INo, float *fJnt	Variable number (Index) Value	in out	CaoController::AddVariable("@J*")	
nrc_get_VarT	Retrieve the current value	long INo, float *fTrans	Variable number (Index) Value	in out	CaoController::AddVariable("@T*")	
nrc_get_VarIO	Retrieve the current value	long INo, long *IValue	I/O number (Index) Value	in out	CaoController::AddVariable("@IO*")	
nrc_put_VarI	Set the current value	long INo, long IValue	Variable number (Index) Value	in in	CaoController::AddVariable("@I*")	
nrc_put_VarF	Set the current value	long INo, float fValue	Variable number (Index) Value	in in	CaoController::AddVariable("@F*")	
nrc_put_VarD	Set the current value	long INo, double dValue	Variable number (Index) Value	in in	CaoController::AddVariable("@D*")	
nrc_put_VarS	Set the current value	long INo, char *szString	Variable number (Index) Value	in in	CaoController::AddVariable("@S*")	
nrc_put_VarV	Set the current value	long INo, float *fVec	Variable number (Index) Value	in in	CaoController::AddVariable("@V*")	
nrc_put_VarP	Set the current value	long INo, float *fPosition	Variable number (Index) Value	in in	CaoController::AddVariable("@P*")	
nrc_put_VarJ	Set the current value	long INo, float *fJnt	Variable number (Index) Value	in in	CaoController::AddVariable("@J*")	
nrc_put_VarT	Set the current value	long INo, float *fTrans	Variable number (Index) Value	in in	CaoController::AddVariable("@T*")	
nrc_put_VarIO	Set the current value	long INo, long IValue	I/O number (Index) Value	in in	CaoController::AddVariable("@IO*")	

9. Arithmetic function

Function name	Description	Parameter	Parameter Description	in/out	Corresponding CAO function (*1)	Notes
nrc_Dev	Calculate DEV	float *fPos1, float *fPos2, float *fPosition	Base position Deviation in the current work coordination Deviated position	in in out	CaoRobot::Execute("DEV")	
nrc_DevH	Calculate DEVH	float *fPos1, float *fPos2, float *fPosition	Base position Deviation in the current tool coordinate Deviated position	in in out	CaoRobot::Execute("DEVH")	
nrc_J2P	Convert J to P	float *fJoint, float *fPosition	Source value Converted value	in out	CaoRobot::Execute("J2P")	
nrc_J2T	Convert J to T	float *fJoint, float *fTrans	Source value Converted value	in out	CaoRobot::Execute("J2T")	
nrc_P2J	Convert P to J	float *fPosition, float *fJoint	Source value Converted value	in out	CaoRobot::Execute("P2J")	
nrc_P2T	Convert P to T	float *fPosition, float *fTrans	Source value Converted value	in out	CaoRobot::Execute("P2T")	
nrc_T2P	Convert T to P	float *fTrans, float *fPosition	Source value Converted value	in out	CaoRobot::Execute("T2P")	
nrc_T2J	Convert T to J	float *fTrans, float *fJoint	Source value Converted value	in out	CaoRobot::Execute("T2J")	
nrc_RPM	Convert rpm(rotation per minute) to speed	long IAxis, float fRevolution, float *fRate	Axis number rpm value Internal speed value	in in out	CaoRobot::Execute("RPM")	
nrc_MPS	Convert mps(m/s) to speed(%)	float fSpeed, float *fRate	mps value Internal speed value	in out	CaoRobot::Execute("MPS")	

10. Task

Function name	Description	Parameter	Parameter Description	in/out	Corresponding CAO function (*1)	Notes
nrc_StartTask	Start a user program	char *szTaskName, long IMode, char *szOption	Task name Start mode Option	in in in	CaoController::AddTask() CaoTask::Start()	
nrc_StopTask	Stop a user program	char *szTaskName, long IMode, char *szOption	Task name Stop mode Option	in in in	CaoController::AddTask() CaoTask::Stop()	
nrc_get_TaskState	Retrieve a program state	char* szTaskName, long *ITask	Task name Current state	in out	CaoController::AddTask() CaoTask::get_Variable("@STATUS")	
nrc_StartRobSlave	Start 'RobSlave' program				CaoController::AddTask("ROBOSLAVE") CaoTask::Start()	
nrc_StopRobSlave	Stop 'RobSlave' program				CaoController::AddTask("ROBOSLAVE") CaoTask::Stop()	
nrc_get_RobSlaveState	Retrieve 'RobSlave' state	long *IState		in	CaoController::AddTask("ROBOSLAVE") CaoTask::get_Variable("@STATUS")	

11. Execution

Function name	Description	Parameter	Parameter Description	in/out	Corresponding CAO function (*1)	Notes
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nrc_ControllerExecute	Execute a command of CaoController	char *pCommand, VARIANT vntParam, VARIANT* pVal	Command Parameter Return value	in in out	CaoController::Execute()	
nrc_RobotExecute	Execute a command of CaoRobot class	char *pCommand, VARIANT vntParam, VARIANT* pVal	Command Parameter Return value	in in out	CaoController::Execute()	

(*1) For the details of the functions, please refer "NetwoRC Provider User's Guide".