Omron Sysmac NJ SQL Client





Part Numbers: NJ501-1320, NJ501-1420, and NJ501-1520

Omron's Sysmac NJ controller comes with built-in SQL client services to Microsoft SQL, Oracle, IBM DB2, MySQL, and Firebird. This allows a machine or system to log data directly into databases running on a server without any middleware or PC.

The Sysmac NJ controller is programmed using premade SQL function blocks, making it simple for the controls programmers to read and write data to/from the SQL database at speeds up to 20ms per transaction.



Omron's Sysmac Studio software is used to configure the connection to the SQL database. The user can configure up to 3 database connections.

Each connection simply requires:

- Connection name
- Database type (Microsoft SQL, Oracle, IBM DB2, MySQL, or Firebird)
- IP address or host name of the target database
- Username and password
- Port name and service name (if not default)

After this information is entered, communication with the DB can be tested. <u>http://youtu.be/ys3Mn2zP-wA</u>



If the connection to the database is lost for whatever reason, the Sysmac NJ controller has a 1Mbyte spooling function built in. This prevents data loss or incorrect data from being logged into the database. By default this option is set to "Use", and spool data will automatically be sent to the DB when the connection is reestablished.

> Execution Logs are automatically stored in the included SD memory card to help with system debugging. For example, if a data insert operation failed because the record was a duplicate with another bar code already in the database, notice that both the SQL command and response are saved in the details. These items are necessary for advanced troubleshooting.

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xecu	ion Log ×	Debug Lo	g	×	SQL	Execution Failure L	.og ×	
Entry	Date/Time	Category	Log Code	Log Name	Result	Connection Name	Serial ID	
00016	9/6/2013 10:20:19.717	SPOOL	0001	INSERT	0x3014	NJEXPRESS	000002594	^
00017	9/6/2013 10:20:25.717	SPOOL	0001	INSERT	0x3014		000002595	
00018	9/6/2013 10:20:36.717	SPOOL	0001	INSERT	0x3014	NJEXPRESS	000002596	
00019	11/9/2013 05:03:32.496	SPOOL	0001	INSERT	0x3011	NJEXPRESS	000000002	
00020	11/9/2013 05:03:46.303	SPOOL	0001	INSERT	0x3014	NJEXPRESS	000000003	
00021	11/9/2013 05:04:14.775	SPOOL	0001	INSERT	0x3014	NJEXPRESS	000000004	
00022	11/9/2013 05:05:37.643	SPOOL	0001	INSERT	0x3011	NJEXPRESS	000000005	
00023	12/19/2013 05:35:02.650	SQL_FAIL	0001	INSERT	0x300B	NJEXPRESS	000000002	$\overline{}$
in	able4 Table4_Insert_Data sert duplicate key in object TIMESTAMP", "BARCODE",		4'. The du	iplicate key	value is		t into Table4	ot
						Upload	Clear	
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Data Type

'Table4' TableName

Table4 Insert Data ManVar BC_SQLTYPE_INSERT SQLType

Table4 Select Data MapVar

_DBC_SQLTYPE_SELECT SQLType

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able4_Insert_Da

DB CreateM#P

DBConnection

DB_CreateM#

Execute

'Table4' TableName

DBConnection

ARRAY[0..19] of SQL_Table4_Type

SQL Table4_Type

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Name

Table4 Insert Data

Table4_Select_Data

SQL_Ready

SQL_Ready

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NJExpress

🖃 🚞 Tables

SQL_Map_Table1_OK

🚞 Database Diagrams

🗉 🚞 System Tables 🕀 🥅 FileTatles



Initial Value |

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Error Tak 1 Map Error (False

ErrorID = Tables Map ErrorID (00)

Busy Table1_Select_Map_Busy (False

Error Table1 Select Map En yr (False

DB Inser xecute

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Busy

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SendStatus

-SQL_Insert_Busy (False)

-SQL_Insert_Error (False)

-SQL_Insert_ErrorID (0000)

-SOL Insert SendStatus (DB. END IN

Table1 Select Map Erron

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The controls programmer does not need to learn how SQL databases work. They simply implement the SQL Function Blocks in Ladder or ST.

DB Connect and DB Close open and close the 3 connections by specifying the Connection Name from the Configuration area of Sysmac Studio. http://youtu.be/_3Ccdj-800A

DB CreateMapping creates a map from a DB Map Variable to a DB table by specifying the Connection Name, Table Name, the variable to be mapped to the fields, and if this variable is to be an insert (DBC SQLTYPE INSERT), select (_DBC_SQLTYPE_SELECT), update or delete.

Specify the table name

Create a structure containing variables that matches the field names of the table (Up to 1000 fields).

You do not have to specify all the fields in the table - just the ones you want to access. The Select statement uses an array variable for the multiple records expected in the response.

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dbo.FH		Structures		I Name	I Base Type	1
dbo.Table3		Union	•	SQL_Table4_Type	STRUCT	NJ
		Enumerated	·	SQL_TABLE4_Type	Silloci	145
😑 🛄 dbo.Table4		and the second s		TIMESTAMP	DATE AND TIME	
🖃 🚞 Coumns			-			-
BARCODI	E (nvarchar(40), null)			BARCODE	STRING[41]	
🔲 QTY (sma	allint, null)			OTY	INT	
TIMESTA	MP (datetime2(7), null)			×		1

SQL_Insert_Do

Retain | Constant | Comment

SQL_Map_Select_Table1_OK

SQL_Map_Table1_OK



Notes:

- The SQL_DBConnection output from the DB_Connect Function Block is used with all the other SQL Function Blocks as an input – indicating which database connection it is communicating with.
- Up to 32 instances of the instructions above can be used simultaneously, allowing communication with many DB tables at once.

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Cat. No. P32I-E-01