

Référence	SDCard_Info
Révision	1.1
Auteur	G. Poirier & JPV
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+ Support	<a href="http://support-omron.fr/">http://support-omron.fr/</a>

## SDCard Info

Fonction	Lecture des informations relatives à la carte mémoire SD
symbole	
Fichier	<a href="#">SDCard_Info.csm2</a>
Condition d'utilisation	<ul style="list-style-type: none"> <li>• Sysmac Studio version 1.1.0 ou supérieur</li> <li>• Firmware NJ V1.09 ou supérieur</li> </ul>
Principe	<p>Le bloc fonction SDCardInfo utilise une commande SendCmd pour lire :</p> <ul style="list-style-type: none"> <li>• Le nom de volume de la carte SD</li> <li>• La date de création (dernier formatage)</li> <li>• La taille totale du disque en Kilo-octets</li> <li>• La taille disponible en Kilo-octets</li> </ul> <p>Le drapeau <code>_Card1Ready</code> passe ON lorsque la carte SD est reconnue par le NJ La variable <code>g_InfoSDCard</code> devra être déclarée dans les variables globales.</p>

### 1- Variable du bloc SDCardInfo

#### Variables d'entrée/sortie

Nom	type	plage	Description
SDInfo	Structure		Voir détail de la structure plus bas

#### Variables d'entrée

Nom	type	plage	Description
Execute	Bool	OFF, ON	ON : Activation du FB

#### Variables de sortie

Nom	type	plage	Description
Done	Bool	OFF, ON	ON : bonne exécution
Error	Bool	OFF, ON	Drapeau d'erreur d'exécution
ErrorID	WORD	0-FFFF	Code erreur
ErrorsIdEx	DWORD	0-FFFFFFFF	Code erreur étendu (voir tableau plus bas)

## 2- Déclaration des structures de données

Le bloc fonction SDCardInfo utilise la structure déclarée dans l'espace de nom :

Name	Base Type	Offset
st_InfoSd	STRUCT	NJ
VolumeName	STRING[13]	
Formatting_DateTime	_sDT	
TotalCapacity	UDINT	
UnusedCapacity	UDINT	

Nom	Description
VolumeName	Nom du volume lors de la création
Formating_DateTime	Date de création du volume
TotalCapacity	Taille total du volume (en Ko)
UnusedCapacity	Taille disponible (en Ko)

Exemple d'information renvoyée par le FB

VolumeName	SDCARD
Formatting_DateTime	
Year	2014
Month	9
Day	14
Hour	12
Min	12
Sec	38
NSec	0
TotalCapacity	3757031424
UnusedCapacity	3757027328

- Le nom de volume de la carte SD est « SDCARD »,
- Sa date de création (dernier formatage) est le 14 Septembre 2014 à 12h12m38s,
- La taille totale disponible est de 3757031424 Kilo-octets,
- La taille disponible est de 3757027328 Kilo-octets.

## 3- Spécifications des cartes SD

Le NJ supporte les cartes

- SD type "normale" de 2Go formatée en FAT16
- SDHC de 4Go formatée en FAT32

## 3-2-1 Models and Specifications

SD cards and SDHC cards are supported, but use one of the following OMRON Cards. OMRON is not responsible for the operation, performance, or write life of any other SD or SDHC card.

Model	Card type	Capacity	Format	Number of overwrites	Weight
HMC-SD291	SD Card	2 GB	FAT16	100,000	2 g max.
HMC-SD491	SDHC Card	4 GB	FAT32	100,000	2 g max.

#### 4- Système de fichier FAT16 et FAT32

Chaque support informatique numérique comme les disques dur, clef USB, Carte SD se décomposent en clusters.

La taille des clusters dépend du formatage.

- FAT 16 : 32768 bytes.
- FAT32 : 4096 bytes.

Avec l'apparition du système de fichiers FAT32, le nombre maximal de clusters par partition est passé de 65535 à 268 435 455 ( $2^{28}-1$ ). La FAT32 autorise donc des partitions d'une taille beaucoup plus élevée (jusqu'à 8 téraoctets). En réalité la taille théorique maximum d'une partition FAT32 est de 8 To, toutefois Microsoft la limite volontairement à 32 Go sur les systèmes Windows 9x afin de favoriser NTFS.

Puisqu'une partition FAT32 peut contenir beaucoup plus de clusters qu'une partition FAT16, il est possible de réduire de façon significative la taille des clusters et de limiter par la même occasion le gaspillage d'espace disque.

Voici Deux exemple d'utilisation de cartes SD l'une de 2Go normale et l'autre de 8Go SDHC

##### a) Carte SD normale de 2 Go :

Après formatage de la carte et en utilisant l'outil Windows CHKDSK :

```
The type of the file system is FAT.
Volume SD created 14/09/2014 11:05
Volume Serial Number is 280E-12E3
Windows is verifying files and folders...
File and folder verification is complete.
Windows has checked the file system and found no problems.

1,975,320,576 bytes total disk space.
1,975,320,576 bytes available on disk.

32,768 bytes in each allocation unit.
60,282 total allocation units on disk.
60,282 allocation units available on disk.
```

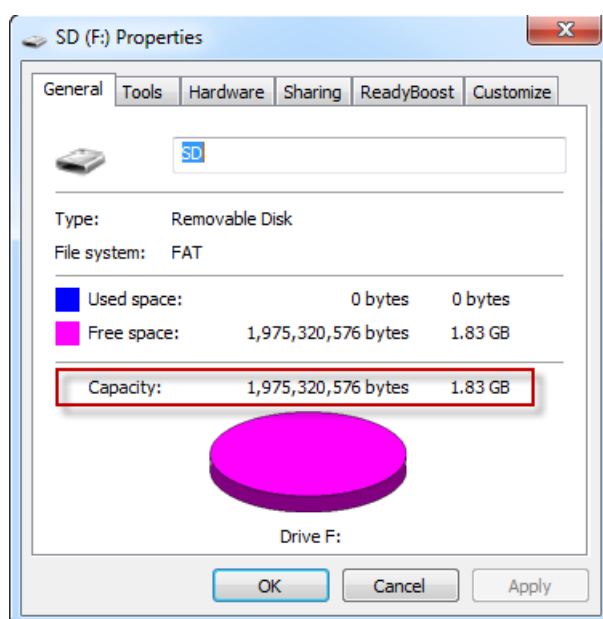
"Each allocation unit" il faut comprendre les clusters. FAT signifie FAT16

La taille totale est de 1.975.320.576 bytes.

Pour convertir cette valeur en Go, il faut diviser 3 fois par 1024 (en info 1kB = 1024 bytes)

$1.975.320.576 \text{ bytes} / (3 \times 1024) = 1.83 \text{ Go}$  cohérent pour une 2Go

D'ailleurs le clic droit sur le disque dans Windows nous le confirme :



Le FB SDCard\_Info renvoi les informations suivantes :

▼ g_InfoSDCard		
VolumeName	SD	
▶ Formatting_DateTime		
TotalCapacity	1975320576	
UnusedCapacity	1975320576	

Si l'on transfert via FTP un fichier de 70211 bytes :

Intro.pdf	70,211	Adobe Acroba...	02/09/2014 20:20:56
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Le résultat sera:

Nom	Valeur en ligne
▼ g_InfoSDCard	
VolumeName	SD
▶ Formatting_DateTime	
TotalCapacity	1975320576
UnusedCapacity	1975222272

La différence entre la valeur « UnusedCapacity » avant est après le transfert est de :

$$1975320576 - 1975222272 = \mathbf{98304 \text{ bytes}}$$

Cette différence de taille est liée au fait qu'un fichier ne peut occuper qu'un nombre entier de clusters :

$$70211 / 32768 = \mathbf{2,142..} \text{ donc 3 clusters}$$

Avec 32768 bytes par cluster en FAT16 on obtient bien :

$$3 * 32768 = \mathbf{98304 \text{ bytes.}}$$

b) Carte SD SDHC de 8 Go :

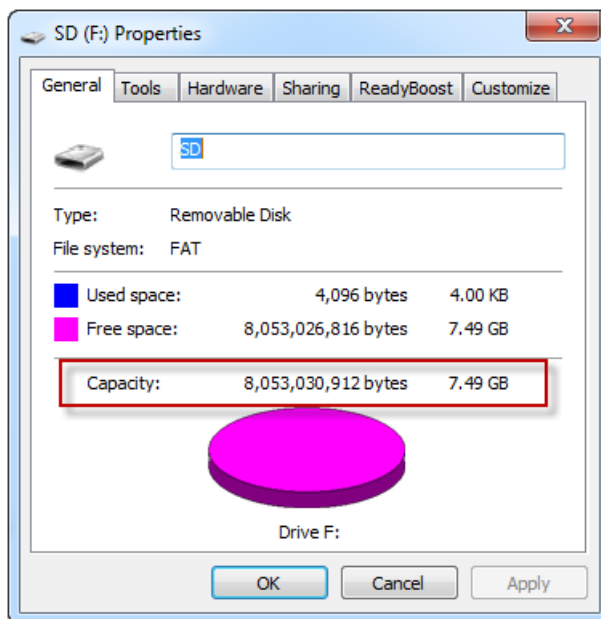
Après formatage de la carte et en utilisant l'outil Windows CHKDSK :

```
C:\Users\poigui>chkdsk H:
The type of the file system is FAT32.
Volume SDCARD created 14/09/2014 10:47
Volume Serial Number is 1A86-6D3B
Windows is verifying files and folders...
File and folder verification is complete.
Windows has checked the file system and found no problems.
 7,863,280 KB total disk space.
 7,863,276 KB are available.

   4,096 bytes in each allocation unit.
 1,965,820 total allocation units on disk.
 1,965,819 allocation units available on disk.
```

La taille totale est de 7.863.280 **Kilo**-octets soit :

$$7.863.280.000 \text{ octets} / (3*1024) = \mathbf{7.49 \text{ Go}}$$
 (cohérent pour une 8Go)



Le FB SDCard\_Info renvoie les informations suivantes :

▼ g_InfoSDCard	
VolumeName	SDCARD
▶ Formatting_DateTime	
TotalCapacity	3757031424
UnusedCapacity	3757027328

Il y a une différence par rapport à Windows car le NJ en FAT32 ne supporte pas des systèmes de fichiers supérieurs à 4Go théorique d'une carte SD.

Cette valeur correspond donc à :

$3757031424 \text{ bytes} / 1024 / 1024 / 1024 = 3.49 \text{ Go}$  ce qui est cohérent pour une carte SD.

Si l'on transfère via FTP un fichier de 70211 bytes :

Intro.pdf	70,211	Adobe Acroba...	02/09/2014 20:20:56
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SDCard\_Info:

▼ g_InfoSDCard	
VolumeName	SDCARD
▶ Formatting_DateTime	
TotalCapacity	3757031424
UnusedCapacity	3756953600

La différence entre la valeur « UnusedCapacity » avant et après le transfert est de :

$$3757031428 - 3756953600 = \mathbf{73728 \text{ bytes}}$$

Cette différence de taille est liée au fait qu'un fichier ne peut occuper qu'un nombre entier de clusters (ici 4096 bytes par cluster en FAT32) :

$$70211 / 4096 = \mathbf{17,4..}$$

Soit 18 clusters de 4096 bytes :

$$18 * 4096 = \mathbf{73728 \text{ bytes}}$$

## 5- Code erreur étendu

Code	erreur	Action corrective
16#00000001	The communications service was interrupted.	<ul style="list-style-type: none"> <li>• Check the data link execution status.</li> <li>• Check the capacity of the transfer destination area on the third node.</li> </ul>
16#00000101	The local node is not part of the network.	Make the local node part of the network.
16#00000102	A token timeout occurred.	Set the local node address to within the maximum node address
16#00000103	The retry count was exceeded.	Perform internode tests. If communications is not normal, check the operating environment.
16#00000104	The allowable number of send frames was exceeded.	Check the status of events in the network and reduce the number of events in each task period. Or, increase the number of allowable send frames.
16#00000105	The IP address of the local node is out of range.	Set the rotary switches on the Serial Communications Unit correctly.
16#00000106	The IP address of the local node is also used by another node in the network.	Change one of the node addresses that are duplicated.
16#00000201	The remote node is not part of the network.	Make the remote node part of the network.
16#00000202	A Unit with the specified unit address does not exist at the destination.	Correctly set the unit address for the destination network address.
16#00000203	The third node is not part of the network.	<ul style="list-style-type: none"> <li>• Check the address of the Unit that is the third node.</li> <li>• Specify only one node for the third node.</li> </ul>
16#00000204	The remote node is busy.	Increase the setting of the number of retries or corrects the system so that communications traffic is not concentrated on the remote node.
16#00000205	A response timeout occurred.	Check the settings of the communications parameters.
16#00000206	There is an error in the transmission path.	<ul style="list-style-type: none"> <li>• Attempt retries.</li> <li>• If this error occurs frequently, check for noise.</li> </ul>
16#00000301	A Communications Controller Error occurred.	Refer to the operation manual for the relevant Unit and make suitable corrections.
16#00000302	There is an error in the CPU Unit at the remote node.	Refer to the manual for the CPU Unit at the remote node and remove the error.
16#00000303	There is an error in the relevant Controller and a response is not returned.	Check the communications status on the network and restart the relevant Controller. If the error still occurs, replace the relevant Controller.
16#00000304	The unit number setting is not correct.	Set the rotary switches on the Serial Communications Unit correctly.
16#00000401	The command that was sent is not supported.	Set the command array correctly.
16#00000402	The Unit model or version is not supported.	Check the Unit model and version.
16#00000501	The remote address setting is wrong.	Set the destination address in the routing tables.
16#00000502	Routing tables are not registered.	Set the source node, destination node, and relay nodes in the routing tables.
16#00000503	There is an error in the routing tables.	Correct the settings in the routing tables.
16#00000504	There are too many relay points.	Restructure the networks or correct the routing tables so that commands are used within a three-layer range.
16#00001001	The command is too long.	Set the command array correctly.
16#00001002	The command is too short.	Set the command array correctly.
16#00001003	The number of write elements that is specified in the command does not agree with the number of write data.	Specify the same number of write elements and write data.
16#00001004	The command format is incorrect.	Set the command array correctly.
16#00001005	There is an error in the header.	Correct the settings in the routing tables.
16#00001101	The area type does not exist.	Refer to the command variables and parameter type codes and set the relevant codes.
16#00001102	An access size is wrong.	Correctly set the variable and parameter access sizes.
16#00001103	An out-of-range address was specified.	Specify an address that is within the process range.
16#00001104	The address range was exceeded.	<ul style="list-style-type: none"> <li>• Specify an address that is within the process range.</li> <li>• Correct the settings in the data link table.</li> </ul>
16#00001106	A communications sequence number that is not registered was specified.	Correct the communications sequence number or add the sequence with the CX-Protocol.
16#00001109	An interrelationship error occurred.	<ul style="list-style-type: none"> <li>• Correct the size relationships in the command data.</li> <li>• Correct the settings in the data link table.</li> </ul>
16#0000110A	Data is redundant.	<ul style="list-style-type: none"> <li>• Cancel the current process or wait for it to be completed before you execute the command.</li> </ul>

		<ul style="list-style-type: none"> <li>• Correct the settings in the data link table.</li> </ul>
16#0000110B	The response is too long.	Set the number of elements in the command array correctly.
16#0000110C	This is another parameter error.	Set the command array correctly.
16#00002002	The data is protected.	Execute the command again after clearing the protection.
16#00002003	There is no registered table.	Set the table correctly.
16#00002004	There is no data that matches the search data.	Set the search data correctly.
16#00002005	The relevant program number does not exist.	Set a valid program number.
16#00002006	The relevant file does not exist.	Set the file name correctly, including the subdirectory names.
16#00002007	A verification error occurred.	<ul style="list-style-type: none"> <li>• Check the contents of memory and write the correct data.</li> <li>• Check the contents of the file.</li> </ul>
16#00002101	Access is not possible because the area is read-only.	Execute the command again after clearing the write protection.
16#00002102	The data is protected or the data link table cannot be written.	<ul style="list-style-type: none"> <li>• Execute the command again after clearing the write protection.</li> <li>• Set the system settings in the data link table.</li> </ul>
16#00002103	Registration is not possible.	<ul style="list-style-type: none"> <li>• Create the file after deleting unnecessary files or prepare new file memory.</li> <li>• Execute the command again after closing open files.</li> </ul>
16#00002105	The relevant program number does not exist.	Set a valid program number.
16#00002106	The relevant file does not exist.	Set the file name correctly, including the subdirectory names.
16#00002107	A file with the same name already exists.	Execute the command again after changing the name of the file to write.
16#00002108	The change is not possible because an error occurred when trying to make it.	Correct the settings.
16#00002201	The operation was not possible because a protocol macros is already in execution.	Use an N.C. program input for the Protocol Macro Execution Flag.
16#00002202	The operating mode is wrong.	Check the operating mode.
16#00002203	The operating mode is wrong for the instruction (PROGRAM mode).	Check the operating mode of the Controller.
16#00002204	The operating mode is wrong for the instruction (DEBUG mode).	Check the operating mode of the Controller.
16#00002205	The operating mode is wrong for the instruction (MONITOR mode).	Check the operating mode of the Controller.
16#00002206	The operating mode is wrong for the instruction (RUN mode).	Check the operating mode of the Controller.
16#00002207	The specified mode is not the polling node.	Confirm which node is the polling node of the network.
16#00002208	The operating mode is wrong for the instruction.	Check step activation status.
16#00002211	The Unit is busy.	Increase the setting of the number of retries or corrects the system so that communications traffic is not concentrated on the relevant Unit.
16#00002301	The file device does not exist.	Insert the media. Or, format the EM.
16#00002302	There is no file memory.	Check the file memory device.
16#00002303	There is no built-in clock.	Check the specifications of the model.
16#00002401	A checksum error occurred in the protocol macro data or the data transfer is not yet completed.	Transfer the protocol macro data from the CX-Protocol again.
16#00002502	There is an error in the part of memory for processing.	Transfer the correct data to memory.
16#00002503	The registered I/O Unit configuration does not agree with the physical Unit configuration.	Check the I/O Unit configuration.
16#00002504	There are too many local or remote I/O points.	Set the number of local and remote I/O points correctly.
16#00002505	An error occurred in a data transmission between the CPU Unit and a CPU Bus Unit.	Check the Units and the connecting cables. After removing the error, execute a command to reset the error.
16#00002506	The same rack number, unit number, or I/O address is set more than once.	Correct the settings so that each number is unique.
16#00002507	An error occurred in a data transmission between the CPU Unit and an I/O Unit.	Check the Units and the connecting cables. After removing the error, execute a command to reset the error.
16#00002509	There is an error in SYSMAC BUS/2 data transmission.	Check the Units and the connecting cables. After removing the error, execute a command to reset the error.
16#0000250A	An error occurred in a CPU Bus Unit data transmission.	Check the Units and the connecting cables. After removing the error, execute a command to reset the error.

16#0000250D	The same word setting is used more than once.	Set the I/O words correctly.
16#0000250F	There is an error in memory.	<ul style="list-style-type: none"> <li>• For internal memory, execute the command again after writing the correct data.</li> <li>• For a Memory Card or EM file memory, execute the expansion memory format command.</li> <li>• If the error cannot be reset with the above corrections, replace the memory.</li> </ul>
16#00002510	The end station setting is wrong.	Set the end station correctly.
16#00002601	Protection is already cleared.	You do not need to clear protection.
16#00002602	The password was wrong.	Specify the correct password.
16#00002604	The data is protected.	<ul style="list-style-type: none"> <li>• Execute the command again after clearing the write protection.</li> <li>• Wait for the service that is currently in execution to end or stop the service, and then execute the command again.</li> </ul>
16#00002605	The service is busy.	Wait for the service that is currently in execution to end or stop the service, and then execute the command again.
16#00002606	The service is stopped.	Execute the relevant service as required.
16#00002607	You do not have the execution right.	<ul style="list-style-type: none"> <li>• Execute the operation from the node that accessed the data link.</li> <li>• If the error still occurs after restarting, replace the Controller.</li> </ul>
16#00002608	The environment is not set.	Make the necessary settings.
16#00002609	The required items are not set.	Set the required items.
16#0000260A	The specified number is already defined.	Execute the command again after changing the specified number to an action or transition number that is not already registered.
16#0000260B	The error cannot be reset.	Remove the cause of the error and then execute the error reset command.
16#00003001	You do not have access rights.	Wait for the access right to be cleared and then execute the command again.
16#00004001	The service was interrupted.	Execute the command again after clearing the cause of the service interruption.