

Description



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Function Description

The `READ_VAR` function is used to read the value of one or more language objects:

- internal bits,
- internal words.

Verify that the objects to be read are consecutive. They may be located in a remote CPU or in a device connected to a communication channel.

On Modicon M340 and M580 CPU, the `READ_VAR` function can read up to 2,000 consecutive bits in a remote device.

On Premium PLCs, the `READ_VAR` function can read up to 1,000 consecutive bits in a remote device, whatever the device and the protocol used may be (Uni-Telway or Modbus/Jbus).

NOTE: For Premium PLCs only, reading over 1000 bits requires the use of the `SEND_REQ` function.

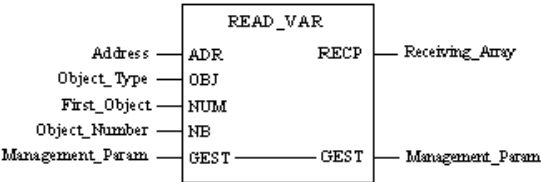
WARNING

EXCHANGED DATA INCOMPATIBILITY
Data structure alignments are not the same for Premium/Quantum and M340/M580 so verify that the data exchanged are compatible. See [DDT: Mapping rules](#) page for alignment rules.
Failure to follow these instructions can result in death, serious injury, or equipment damage.

The additional parameters `EN` and `ENO` can be configured.

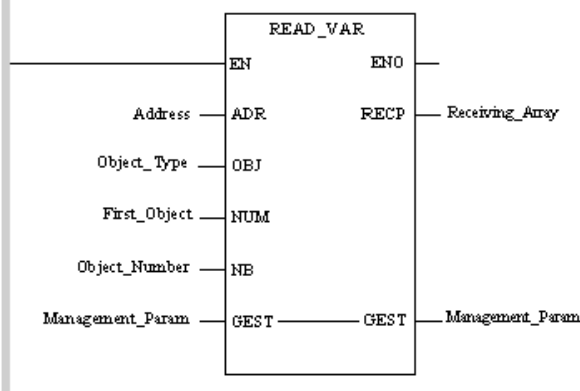
BD Representation

Representation:



.D Representation

Representation:



L Representation

Representation:

LD Address
`READ_VAR` `Object_Type`, `First_Object`, `Object_Number`, `Management_Param`, `Receiving_Array`

ST Representation

Representation:

```
READ_VAR(Address, Object_Type, First_Object, Object_Number, Management_Param, Receiving_Array);
```

Parameter Description

The following table describes the input parameters:

Parameter	Type	Comment
Address	ARRAY [0..5] OF INT for Premium ARRAY [0..7] OF INT for Modicon M340 and M580	Specific statements by hardware platforms: - Premium: - Address of the message's receiving character mode channel is given by the ADDR function. - Address of the destination entity of the exchange. The following addresses are prohibited: {Network.Station}APP, {Network.Station}APP.num. - Modicon M340: - Address of the message's receiving character mode channel is given by the ADDM function. - The syntax of the address is of ADDM ('r.m.c.node')-type. - Modicon M580: - Address of the destination entity of the read operation, result of ADDMX function.
Object_Type	STRING	Type of objects to read for Premium PLC: '%M': internal bits '%MW': internal words '%S': system bits '%SW': system words '%I': input bits '%IW': input words Type of objects to read for Modicon M340 and M580 CPU: '%M': internal bits '%MW': internal words '%I': input bits '%IW': input words
First_Object	DINT	Index of the first object to read.
Object_Number	INT	Number of objects to read.

The following table describes the input/output parameters:

Parameter	Type	Comment
Management_Param	ARRAY [0..3] OF INT	Exchange management table On Modicon M340 and M580 CPUs, a cancel bit is available in the rank 1 word of the exchange management table. This cancel bit is located at the rank 1 word which consists of 2 bytes: - Most significant byte: exchange number - Least significant byte: activity bit (rank 0) and cancel bit (rank 1). The READ_VAR EF can be canceled by the CANCEL EF or by setting to 1 the cancel bit of the management table .

The following table describes the output parameters:

Parameter	Type	Comment
Receiving_Array	ARRAY [n..m] OF INT	Word table containing the value of the objects read. NOTE: The size of the data received (in bytes) is written automatically by the system in the fourth word of the management table.

Rules of Use

Verify that object types are entered consistently. Write entries either all in lower case or all in upper case; otherwise, the function sends back a report equal to 16#06 (incorrect specific parameters).

For Micro, Premium or Atrium PLCs receiving the **READ_VAR** function, read-only access to internal bits has the following particularities:

- The forcing value of the bits is returned in the response,
- Reading 1 bit therefore comprises 2 response bytes:
 - The first contains the value of the 8 bits from the one requested.
 - The second indicates whether these bits have been forced.
- In order to read one of the last 8 bits of the memory it is necessary to read all the last 8 bits, otherwise the function sends back a 16#01 operation report. This last particularity also applies to Modicon M340 and M580 PLCs.

NOTE: Verify that space for the forcing indication bytes are provided for in the receive table; otherwise, a 16#03 detected error code is sent back in the report.

NOTE: For Modicon M340/M580 PLCs, forced bits are not accessed by **READ_VAR** and **WRITE_VAR** functions, since Modbus protocol does not support it.

Simultaneous Transactions

The following table gives the capacities of each communication channel to simultaneously process transactions according to various configurations on Micro and Premium PLCs.

Configuration	Micro	TSX 57 10	TSX 57 20	TSX 57 23/30/40/45/55, PCX 57, PMX 57	TSX 57 46/56
Uni-Telway master terminal port	4	4	4	4	8
Uni-Telway master PCMCIA or SCY link	1	8	8	8	8
Uni-Telway client slave terminal port	4	1	1	1	8
Uni-Telway client slave PCMCIA or SCY link	1	1	1	1	1
Uni-Telway server slave terminal port	4	4	4	4	4
Uni-Telway server slave PCMCIA or SCY link	4	6	6	6	6
Modbus terminal port	4	-	-	-	-
Modbus PCMCIA or SCY link	4	8	8	8	8
Character mode terminal block	1	1	1	1	1
Character mode PCMCIA or SCY link	4	8	8	8	8
CANopen PCMCIA	-	10	10	10	10
Fipway PCMCIA or SCY link	4	8	8	8	8
Modbus Plus	4	4	4	4	4
Ethernet	-	16	16	16	16

Embedded Ethernet	-	-	-	-	64
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Capacities of each communication channel to simultaneously process transactions according to various configurations on Modicon M340 PLCs:

Configuration	BMX P34 1000	BMX P34 2000	BMX P34 2010/20102	BMX P34 2020	BMX P34 2030/20302
Embedded CANopen	-	-	16	-	16
Embedded Ethernet	-	-	-	16	16
Modbus master serial port	8	16	16	16	-

Maximum number of requests as client per scan on *standalone* M580 CPUs:

Configuration	CPU Reference (BME P58 ...)					
	10•0	20•0	30•0	40•0	5040	6040
Ethernet	16	32	48	80	80	96

Maximum number of requests as client per scan on *Hot Standby* M580 CPUs:

Configuration	CPU Reference (BME H58 ...)		
	2040	4040	6040
Ethernet	32	80	96

Maximum number of requests served per scan on *standalone* M580 CPUs:

Configuration	CPU Reference (BME P58 ...)					
	10•0	20•0	30•0	40•0	5040	6040
CPU from all origin ^(1.)	16	24	32	40	48	64
Embedded Ethernet	8	12	16	24 ^(2.)	32	32
USB	4	4	4	4	4	4
^{1.} %SW90 system word allows to adjust the number of requests served per cycle. The minimum number of requests served per cycle is set to 2 in order to reduce the CPU jitter. ^{2.} Maximum number of requests is 16 for M580 CPU BME P58 40•0 with firmware version ≤ 1.20.						

Maximum number of requests served per scan on *Hot Standby* M580 CPUs:

Configuration	CPU Reference (BME H58 ...)		
	2040	4040	6040
CPU from all origin ^(1.)	24	40	64
Embedded Ethernet	12	24	32
USB	4	4	4
^{1.} %SW90 system word allows to adjust the number of requests served per cycle. The minimum number of requests served per cycle is set to 2 in order to reduce the CPU jitter.			

NOTE: Verify that the maximum number of simultaneous requests given in all tables takes into account the maximum number of simultaneous requests that each CPU can manage per cycle, *as Client and as Server*.