DUET AD

RDREC / WRREC
on Tia Portal

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Function block

Inside a cyclic function block, two instances as below are used:

```
IF #AxisStruct.RWRecord.Request THEN
    IF #AxisStruct.RWRecord.Write THEN
        #WRREC_Ist(REQ:=#AxisStruct.RWRecord.Request,
                   ID:=#AxisStruct.RWRecord.DeviceID,//273
                   INDEX:=#AxisStruct.RWRecord.Index,
                   LEN:=#AxisStruct.RWRecord.DataLength,
                   DONE=>#AxisStruct.RWRecord.Valid,
                   BUSY=>#AxisStruct.RWRecord.Busy,
                   ERROR=>#AxisStruct.RWRecord.Error,
                   STATUS=>#AxisStruct.RWRecord.Status,
                   RECORD:=#AxisStruct.RWRecord.DataDWord);
    ELSE
        #RDREC_Ist(REQ:=#AxisStruct.RWRecord.Request,
                ID:=#AxisStruct.RWRecord.DeviceID,//273
                INDEX:=#AxisStruct.RWRecord.Index,
                MLEN:=#AxisStruct.RWRecord.DataLength,
                BUSY=>#AxisStruct.RWRecord.Busy,
                ERROR=>#AxisStruct.RWRecord.Error,
                STATUS=>#AxisStruct.RWRecord.Status,
                VALID=>#AxisStruct.RWRecord.Valid,
                RECORD:=#AxisStruct.RWRecord.DataDWord);
        END_IF;

    IF #AxisStruct.RWRecord.Error THEN
        #StatusRDREC := #AxisStruct.RWRecord.Status;
    ELSE
        IF #AxisStruct.RWRecord.Valid THEN
            #AxisStruct.RWRecord.Request := FALSE;
        END_IF;
    END_IF;
END_IF;
```

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Variables and structures

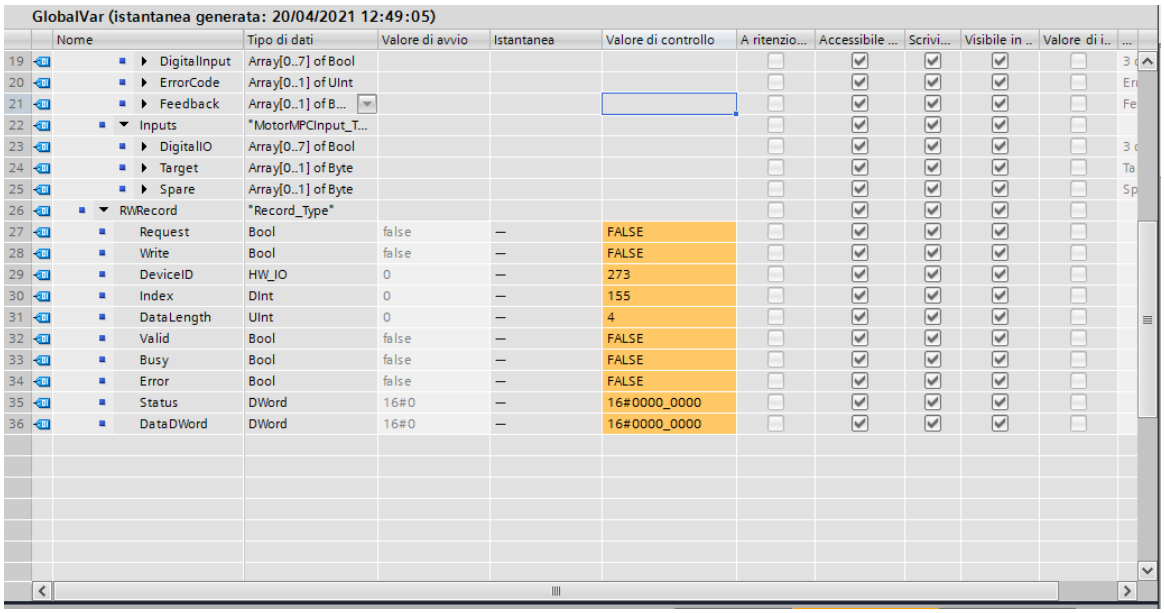
Variables *WRRWC_Ist* and *RDREC_Ist* types are respectively *WRREC* and *RDREC*.
Functions *WRREC* and *RDREC* are implemented inside Siemens's library of Tiaportal 15 SW.
Structure *RWRecord* is put inside structure *AxisStruct* and is used to put data in *RDREC* and *WRREC* functions.

The structure *RWRecord* is composed by variables below:

- **Request** → BOOL
- **Write** → BOOL
- **DeviceID** → HW_IO
- **Index** → DINT
- **DataLength** → UINT
- **Busy** → BOOL
- **Error** → BOOL
- **Status** → DWORD
- **Valid** → BOOL
- **DataDWord** → DWORD

How to read and write records online

- Set read or write record's values:

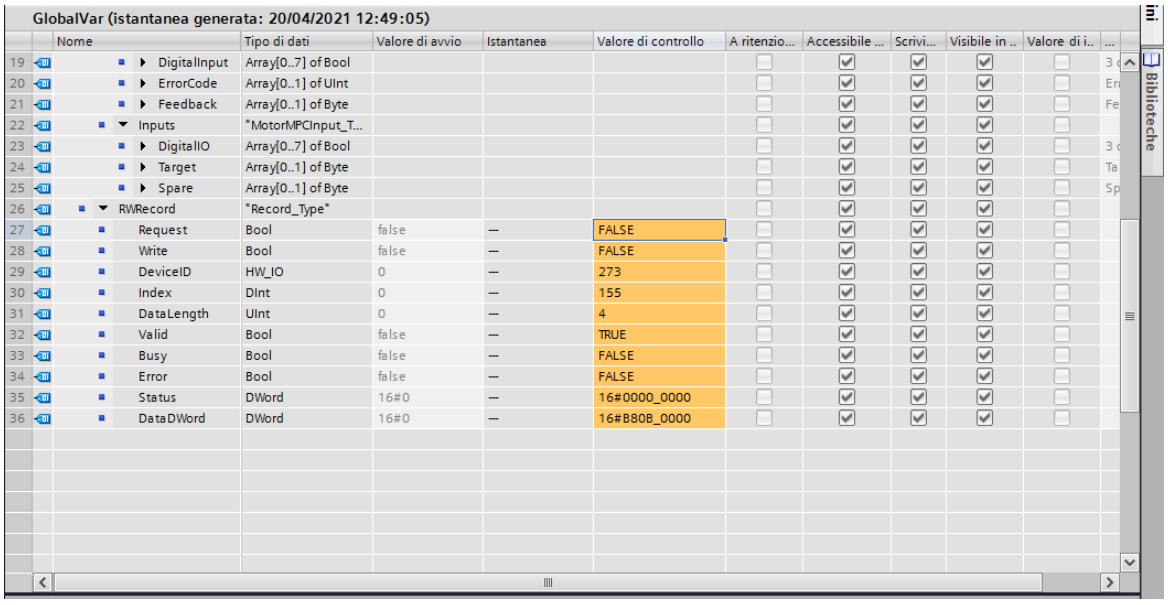


	Nome	Tipo di dati	Valore di avvio	Istantanea	Valore di controllo
19	DigitalInput	Array[0..7] of Bool			
20	ErrorCode	Array[0..1] of UInt			
21	Feedback	Array[0..1] of B...			
22	Inputs	"MotorMPCInput_T...			
23	DigitalIO	Array[0..7] of Bool			
24	Target	Array[0..1] of Byte			
25	Spare	Array[0..1] of Byte			
26	RWRecord	"Record_Type"			
27	Request	Bool	false	–	FALSE
28	Write	Bool	false	–	FALSE
29	DeviceID	HW_IO	0	–	273
30	Index	DInt	0	–	155
31	DataLength	UInt	0	–	4
32	Valid	Bool	false	–	FALSE
33	Busy	Bool	false	–	FALSE
34	Error	Bool	false	–	FALSE
35	Status	DWord	16#0	–	16#0000_0000
36	DataDWord	DWord	16#0	–	16#0000_0000

Values setted are:

1. **DeviceID** = 273 (device's identifier we want to reach with the specific record).
2. **Index** = 155 (Object index we want to modify)
3. **DataLength** = 4 (Length of the message written or read)

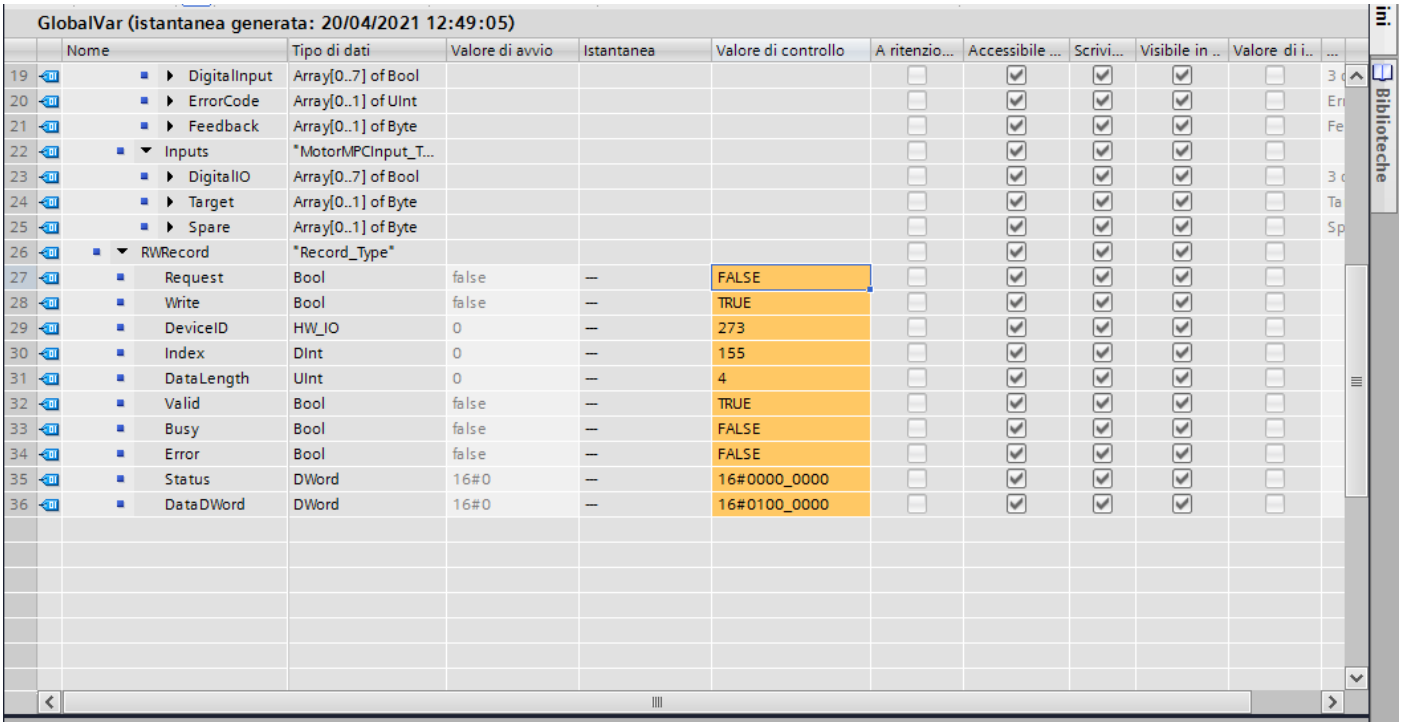
- Value of the object readed:



	Nome	Tipo di dati	Valore di avvio	Istantanea	Valore di controllo
19	DigitalInput	Array[0..7] of Bool			
20	ErrorCode	Array[0..1] of UInt			
21	Feedback	Array[0..1] of Byte			
22	Inputs	"MotorMPCInput_T...			
23	DigitalIO	Array[0..7] of Bool			
24	Target	Array[0..1] of Byte			
25	Spare	Array[0..1] of Byte			
26	RWRecord	"Record_Type"			
27	Request	Bool	false	–	FALSE
28	Write	Bool	false	–	FALSE
29	DeviceID	HW_IO	0	–	273
30	Index	DInt	0	–	155
31	DataLength	UInt	0	–	4
32	Valid	Bool	false	–	TRUE
33	Busy	Bool	false	–	FALSE
34	Error	Bool	false	–	FALSE
35	Status	DWord	16#0	–	16#0000_0000
36	DataDWord	DWord	16#0	–	16#B80B_0000

To read acceleration value, set *Request* variable to TRUE (algorithm will set it automatically to FALSE when the function is executed).
Received value is 16#00000BB8, equivalent to 3000 rpm/s.

- Write value 1 inside the *Acceleration* object:



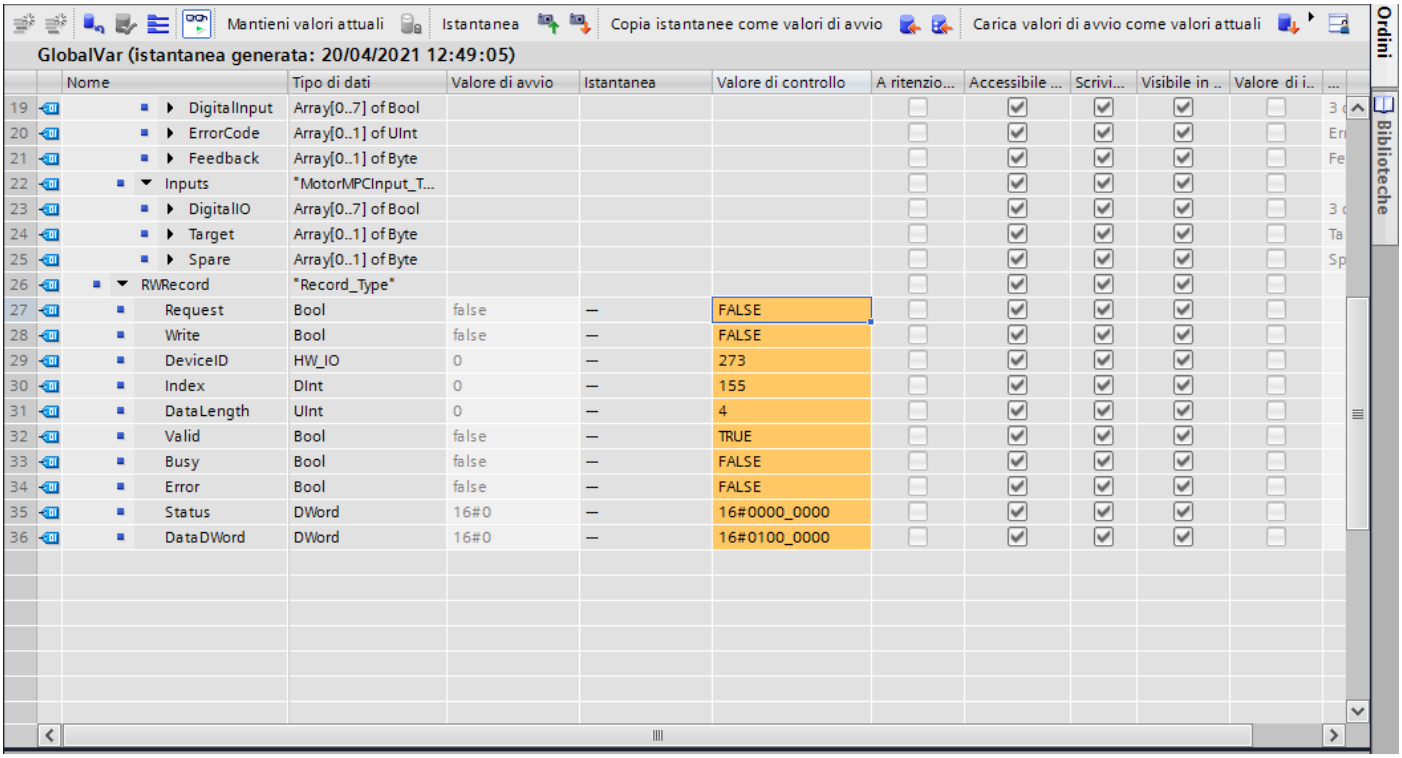
GlobalVar (istantanea generata: 20/04/2021 12:49:05)

	Nome	Tipo di dati	Valore di avvio	Istantanea	Valore di controllo
19	DigitalInput	Array[0..7] of Bool			
20	ErrorCode	Array[0..1] of UInt			
21	Feedback	Array[0..1] of Byte			
22	Inputs	"MotorMPCInput_T...			
23	DigitalIO	Array[0..7] of Bool			
24	Target	Array[0..1] of Byte			
25	Spare	Array[0..1] of Byte			
26	RWRecord	"Record_Type"			
27	Request	Bool	false	—	FALSE
28	Write	Bool	false	—	TRUE
29	DeviceID	HW_IO	0	—	273
30	Index	DInt	0	—	155
31	DataLength	UInt	0	—	4
32	Valid	Bool	false	—	TRUE
33	Busy	Bool	false	—	FALSE
34	Error	Bool	false	—	FALSE
35	Status	DWord	16#0	—	16#0000_0000
36	DataDWord	DWord	16#0	—	16#0100_0000

To write values on drive is necessary to:

1. Set value to write inside *DataDWord* variable.
2. Set the *Write* variable to TRUE
3. Set the *Request* variable to TRUE

- Verify that value inside *Acceleration* object is correctly written:



	Nome	Tipo di dati	Valore di avvio	Istantanea	Valore di controllo
19	DigitalInput	Array[0..7] of Bool			
20	ErrorCode	Array[0..1] of UInt			
21	Feedback	Array[0..1] of Byte			
22	Inputs	"MotorMPCInput_T...			
23	DigitalIO	Array[0..7] of Bool			
24	Target	Array[0..1] of Byte			
25	Spare	Array[0..1] of Byte			
26	RWRecord	"Record_Type"			
27	Request	Bool	false	—	FALSE
28	Write	Bool	false	—	FALSE
29	DeviceID	HW_IO	0	—	273
30	Index	DInt	0	—	155
31	DataLength	UInt	0	—	4
32	Valid	Bool	false	—	TRUE
33	Busy	Bool	false	—	FALSE
34	Error	Bool	false	—	FALSE
35	Status	DWord	16#0	—	16#0000_0000
36	DataDWord	DWord	16#0	—	16#0100_0000

To write another value inside the drive is necessary to:

1. Set to 16#0000_0000 the *DataDWord* variable (this variable is overwritten at each execution of *WRREC* and *RDREC* function. We set it to 16#0000_0000 to be sure that a new value is loaded from drive).
2. Set to FALSE the *Write* variable.
3. Set to TRUE the *Request* variable.

Same operations can be performed for the following mapped objects inside the drive:

- *Acceleration* Object → 155
- *Deceleration* Object → 157
- *Speed* Object → 161

Each objects are 4 bytes dimension.