# **DUET AD**

RDREC / WRREC on Tia Portal

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Version	Date	Author	Note
1.1	27/01/2021		En version first release



#### **Function block**

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

```
7 DIF #AxisStruct.RWRecord.Request THEN
8 🛱
        IF #AxisStruct.RWRecord.Write THEN
 9 🛓
            #WRREC Ist (REQ:=#AxisStruct.RWRecord.Request,
10
                        ID:=#AxisStruct.RWRecord.DeviceID,//273
                        INDEX:=#AxisStruct.RWRecord.Index,
11
                        LEN:=#AxisStruct.RWRecord.DataLength,
12
13
                        DONE=>#AxisStruct.RWRecord.Valid,
14
                        BUSY=>#AxisStruct.RWRecord.Busy,
15
                        ERROR=>#AxisStruct.RWRecord.Error,
16
                        STATUS=>#AxisStruct.RWRecord.Status,
17
                        RECORD:=#AxisStruct.RWRecord.DataDWord);
18
        ELSE
19 🛱
            #RDREC_Ist(REQ:=#AxisStruct.RWRecord.Request,
                     ID:=#AxisStruct.RWRecord.DeviceID,//273
20
21
                     INDEX:=#AxisStruct.RWRecord.Index,
22
                    MLEN:=#AxisStruct.RWRecord.DataLength,
                     BUSY=>#AxisStruct.RWRecord.Busy,
23
24
                     ERROR=>#AxisStruct.RWRecord.Error,
25
                     STATUS=>#AxisStruct.RWRecord.Status,
                    VALID=>#AxisStruct.RWRecord.Valid,
26
27
                     RECORD:=#AxisStruct.RWRecord.DataDWord);
            END IF;
28
29
        IF #AxisStruct.RWRecord.Error THEN
30 白
            #StatusRDREC := #AxisStruct.RWRecord.Status;
31
32
        ELSE
33 白
            IF #AxisStruct.RWRecord.Valid THEN
34
                 #AxisStruct.RWRecord.Request := FALSE;
35
            END IF:
36
        END IF;
37
    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  $\rightarrow$  BOOL
- **DeviceID**  $\rightarrow$  HW\_IO
- Index  $\rightarrow$  DINT
- DataLength → UINT
- **Busy**  $\rightarrow$  BOOL
- **Error**  $\rightarrow$  BOOL
- Status  $\rightarrow$  DWORD
- Valid  $\rightarrow$  BOOL
- **DataDWord** → DWORD



## How to read and write records online

• Set read or write record's values:

Glo	balVar (i	istantanea gener	ata: 20/04/2021 12	2:49:05)								
	Nome		Tipo di dati	Valore di avvio	Istantanea	Valore di controllo	A ritenzio	Accessibile	Scrivi	Visibile in	Valore di i	
19 🕣		DigitalInput	Array[07] of Bool					<b>V</b>	<b>V</b>	<b>V</b>		3 ( 🔨
20 🕣		ErrorCode	Array[01] of UInt					<b>V</b>	<b>V</b>	<b>V</b>		En
21 🕣		Feedback	Array[01] of B					<b>V</b>	<b>V</b>	Image: A start of the start		Fe
22 🕣		<ul> <li>Inputs</li> </ul>	"MotorMPCInput_T					<b>V</b>	<b>V</b>	<b>V</b>		
23 🕣		DigitalIO	Array[07] of Bool					<b>V</b>	<b>V</b>	<b>V</b>		З с
24 🕣		Target	Array[01] of Byte					<b>V</b>	<b>V</b>	Image: A start of the start		Та
25 🕣		Spare	Array[01] of Byte					<b>V</b>	<b>V</b>	<b>V</b>		Sp
26 🕣	• •	RWRecord	"Record_Type"					<b>V</b>	<b>V</b>	<b>V</b>		
27 🕣		Request	Bool	false	-	FALSE		<b>V</b>	<b>V</b>	Image: A start of the start		
28 🕣		Write	Bool	false	-	FALSE		<b>V</b>	<b>V</b>	<b>V</b>		
29 🕣		DeviceID	HW_IO	0	-	273		<b>V</b>	<b>V</b>	<b>V</b>		
30 🕣		Index	Dint	0	-	155		<b>V</b>	<b>V</b>	<b>V</b>		
31 🕣	<b>-</b> -	DataLength	UInt	0	-	4		<b>V</b>	<b>V</b>	<b>V</b>		=
32 🕣		Valid	Bool	false	-	FALSE		<b>V</b>	<b>V</b>	<b>V</b>		
33 🕣		Busy	Bool	false	-	FALSE		<b>V</b>	<b>V</b>	<b>v</b>		
34 🕣		Error	Bool	false	-	FALSE			<b>V</b>	<b>V</b>		
35 🕣		Status	DWord	16#0	-	16#0000_0000		<b>V</b>	<b>V</b>	<b>V</b>		
36 🕣		DataDWord	DWord	16#0	-	16#0000_0000		<b>V</b>	<b>V</b>	<b>V</b>		
												~
<												>

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:

	Glob	oalVar	(is	tant	anea gener	ata: 20/04/2021 12	2:49:05)									Ξ
	1	lome				Tipo di dati	Valore di avvio	Istantanea	Valore di controllo	A ritenzio	Accessibile	Scrivi	Visibile in	Valore di i		
19				•	DigitalInput	Array[07] of Bool					<b>V</b>	<ul> <li>Image: A start of the start of</li></ul>			301	V LL
20				•	ErrorCode	Array[01] of UInt					$\checkmark$	<ul> <li>Image: A start of the start of</li></ul>	$\checkmark$		En	8
21				•	Feedback	Array[01] of Byte					$\checkmark$	<b>V</b>	$\checkmark$		Fe	1
22			•	Inp	uts	*MotorMPCInput_T					$\checkmark$	<b>V</b>	$\checkmark$			lē
23				•	DigitalIO	Array[07] of Bool					$\checkmark$	<b>V</b>	$\checkmark$		Зс	he
24				•	Target	Array[01] of Byte					$\checkmark$	<b>V</b>	$\checkmark$		Та	
25				•	Spare	Array[01] of Byte					<ul> <li>Image: A start of the start of</li></ul>	<b>V</b>	<b>~</b>		Sp	
26			R	WRec	ord	"Record_Type"					<b>V</b>	$\checkmark$	$\checkmark$			
27				Red	quest	Bool	false	-	FALSE		<b>~</b>	<b>V</b>	$\checkmark$			
28				Wri	te	Bool	false	-	FALSE		<b>~</b>	<ul> <li>Image: A start of the start of</li></ul>	$\checkmark$			
29				De	viceID	HW_IO	0	-	273		<b>~</b>	<ul> <li>Image: A start of the start of</li></ul>	$\checkmark$			
30				Ind	ex	Dint	0	-	155		<b>~</b>	<ul> <li>Image: A start of the start of</li></ul>	$\checkmark$			
31				Da	taLength	UInt	0	-	4		<b>~</b>	<ul> <li>Image: A start of the start of</li></ul>	$\checkmark$		=	
32				Val	id	Bool	false	-	TRUE		<b>~</b>	<ul> <li>Image: A start of the start of</li></ul>	$\checkmark$			
33				Bus	sy	Bool	false	-	FALSE		<b>~</b>		$\checkmark$			
34				Err	or	Bool	false	-	FALSE		<b>~</b>	<ul> <li>Image: A start of the start of</li></ul>	$\checkmark$			
35				Sta	tus	DWord	16#0	-	16#0000_0000		<b>V</b>	<ul> <li>Image: A start of the start of</li></ul>	$\checkmark$			
36				Da	taDWord	DWord	16#0	-	16#B80B_0000		<b>~</b>	<ul> <li>Image: A start of the start of</li></ul>	<b>~</b>			
															1	/
	<														>	

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.

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• Write value 1 inside the *Acceleration* object:

	Global	Var	(ist	antanea gener	ata: 20/04/2021 12	2:49:05)									3
	Nor	ne			Tipo di dati	Valore di avvio	Istantanea	Valore di controllo	A ritenzio	Accessibile	Scrivi	Visibile in	Valore di i		
19				DigitalInput	Array[07] of Bool					<b>~</b>	<b>V</b>	<b>v</b>		30	, LL
20			•	ErrorCode	Array[01] of UInt					$\checkmark$	<b>V</b>	<b>v</b>		En	Bib
21				Feedback	Array[01] of Byte					$\checkmark$	$\checkmark$	<b>V</b>		Fe	li
22			•	Inputs	"MotorMPCInput_T					$\checkmark$	$\checkmark$	<b>V</b>			lec
23				DigitalIO	Array[07] of Bool					<b>~</b>	<b>V</b>	<b>V</b>		З с	he
24				Target	Array[01] of Byte				-	<b>~</b>	<b>V</b>	<b>V</b>		Та	
25				Spare	Array[01] of Byte					<b>~</b>	$\checkmark$	<b>V</b>		Sp	
26		• •	RV	VRecord	"Record_Type"					$\checkmark$	$\checkmark$	$\checkmark$			
27				Request	Bool	false		FALSE		<b>~</b>	$\checkmark$	<b>V</b>			
28				Write	Bool	false		TRUE		<b>~</b>	<b>V</b>	<b>V</b>			
29		. •		DeviceID	HW_IO	0		273		$\checkmark$	<b>V</b>	<b>V</b>			
30		. •		Index	Dint	0	-	155		$\checkmark$	<b>V</b>	<b>V</b>			
31		. •		DataLength	UInt	0	-	4		<b>~</b>	<b>V</b>	<b>V</b>		=	
32				Valid	Bool	false	-	TRUE		<b>~</b>	<b>V</b>	<b>V</b>			
33		•		Busy	Bool	false	-	FALSE		<b>~</b>	<b>V</b>	<b>V</b>			
34		. •		Error	Bool	false	-	FALSE		$\checkmark$	<b>V</b>	<b>V</b>			
35		. •		Status	DWord	16#0	-	16#0000_0000		<b>~</b>	<b>v</b>	<b>v</b>			
36		. •		DataDWord	DWord	16#0	-	16#0100_0000		<b>~</b>	<b>V</b>	<b>V</b>			
														~	1
	<													>	

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:

	<b>1</b>	<b>i</b> ., E	Mantier	nivaloriattuali 🔒	Istantanea 🌳	🔍 Copia ista	ntanee come valori di av	vio 🛃 🛃	Carica valori	di avvio d	come valori a	ttuali 🛃 🕨	
	alob N	alvar Iome	(istantanea gener	ata: 20/04/2021 1. Tipo di dati	2:49:05) Valore di avvio	Istantanea	Valore di controllo	A ritenzio	Accessibile	Scrivi	Visibile in	Valore di i	
19 -			DigitalInput	Array[07] of Bool									30~
20 -	•		ErrorCode	Array[01] of UInt								Ē	En
21 .	-		Feedback	Array[01] of Byte								Ē	Fe
22 -	-		<ul> <li>Inputs</li> </ul>	"MotorMPCInput_T									5
23 -	-		DigitallO	Array[07] of Bool									30
24 -	-		Target	Array[01] of Byte									Та
25 -	•		Spare	Array[01] of Byte									Sp
26 -	-		RWRecord	"Record_Type"									
27 -	-		Request	Bool	false	-	FALSE						
28 -	-		Write	Bool	false	-	FALSE						
29 -	-		DeviceID	HW_IO	0	-	273			<b>V</b>	Image: A start of the start		
30 -	-		Index	Dint	0	-	155			<b>V</b>	Image: A start and a start		
31 -			DataLength	UInt	0	-	4			<b>V</b>	Image: A start and a start		
32 -	-		Valid	Bool	false	-	TRUE		<b>~</b>	<b>V</b>	<b>V</b>		
33 -	-		Busy	Bool	false	-	FALSE		<b>V</b>	<b>V</b>	<b>V</b>		
34 -	-		Error	Bool	false	-	FALSE		<b>~</b>	$\checkmark$	<b>V</b>		
35 -	-		Status	DWord	16#0	-	16#0000_0000		<b>~</b>	$\checkmark$	<b>V</b>		
36 -	-		DataDWord	DWord	16#0	-	16#0100_0000		<b>~</b>	$\checkmark$	<b>V</b>		
													~
	<												>

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  $\rightarrow$  155
- Deceleration Object  $\rightarrow$  157
- Speed Object  $\rightarrow$  161

Each objects are 4 bytes dimension.

