Release Note

08/22 MZ040048EN

DX-NET-SWD3
PowerXL DE1, DC1
Change Notification due to the launch of the PROFINET Interface

Powering Business Worldwide

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Original Release Note

Original document is the English version of this Release Note.

All non-english language versions of this document are translations of the original Release Note.

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1 Document Purpose

Due to the launch of the DX-NET-PROFINET2-2 with PROFIdrive profiles, we needed to change the firmware of our variable speed starter DE1 and variable frequency drive DC1 to pass the PROFINET and PROFIdrive certification process. The changes impact the SmartWire-DT behaviour.

With this document, we want to inform you upfront to limit the impact on customer side. All affected manuals will be updated accordingly.

1.1 Drive firmware updates

During the Eaton DX-NET-PROFINET2-2 project deltas between SmartWire-DT implementation and required PROFIdrive functionality. This documents details changes made to the IO and Power Stage firmware that will have an impact on the operation of SmartWire-DT applications.

	SmartWire	ProfiDrive
DC1 3ph	V2.04 and below	V2.10 and above
DC1 1ph	V2.04 and below	V2.10 and above
DE1	V2.10 and below	V2.20 and above
DE11	V2.10 and below	V2.20 and above

1.2 ProfiDrive parameter values

The correct execution of the ProfiDrive state machine requires the Drive parameters to be configured to non-default values.

This document details the parameter values required to:

- correct execution of the state machine
- execution of ProfiDrive Certification

2 Telegram updates

2.1 ZSW1 bit8 Speed Error Tolerance Range

SmartWire-DT	PROFIdrive	Delta	DC1 3ph	DC1 1ph	DE1/DE11
Calculated only when output frequency is static (set point reached). When output frequency is dynamic (ramping) the tolerance is not calculated and bit8 indicates 'within tolerance'	In tolerance calculated as delta between Output Freq & Motor Frequency is less the 10% of Set point Calculated when output frequency is static (set point reached) and output frequency is dynamic (ramping)	Tolerance band calculation method updated. SmartWire-DT application reacting to 'out of tolerance' events may now report events whilst motor speed is ramping due to motor inertia etc	ProfiDrive operation supported	Existing SmartWire-DT behaviour is still valid	Existing SmartWire-DT behaviour is still valid

2.2 'Coast to Stop' (STW1 bit1 & ZSW1 bit4)

SmartWire-DT	PROFIdrive	Delta	DC1 3ph	DC1 1ph	DE1/DE11
STW1 bit1 0: No coast to stop 1: Coast to stop ZSW1 bit 4 (Coast to Stop) 0: Not Active 1: Active	STW1 bit1 0: Coast to stop 1: No coast to stop ZSW1 bit 4 (Coast to Stop) 0: Active 1: Not Active	Command and status bit logic is inverted SmartWire-DT applications will need to update STW1 bit1 & ZSW1 bit4 logic to transition between states	PROFIdrive operation supported	PROFIdrive operation supported	PROFIdrive operation supported

2.3 ‘Quick Stop’ (STW1 bit2 & ZSW1 bit5)

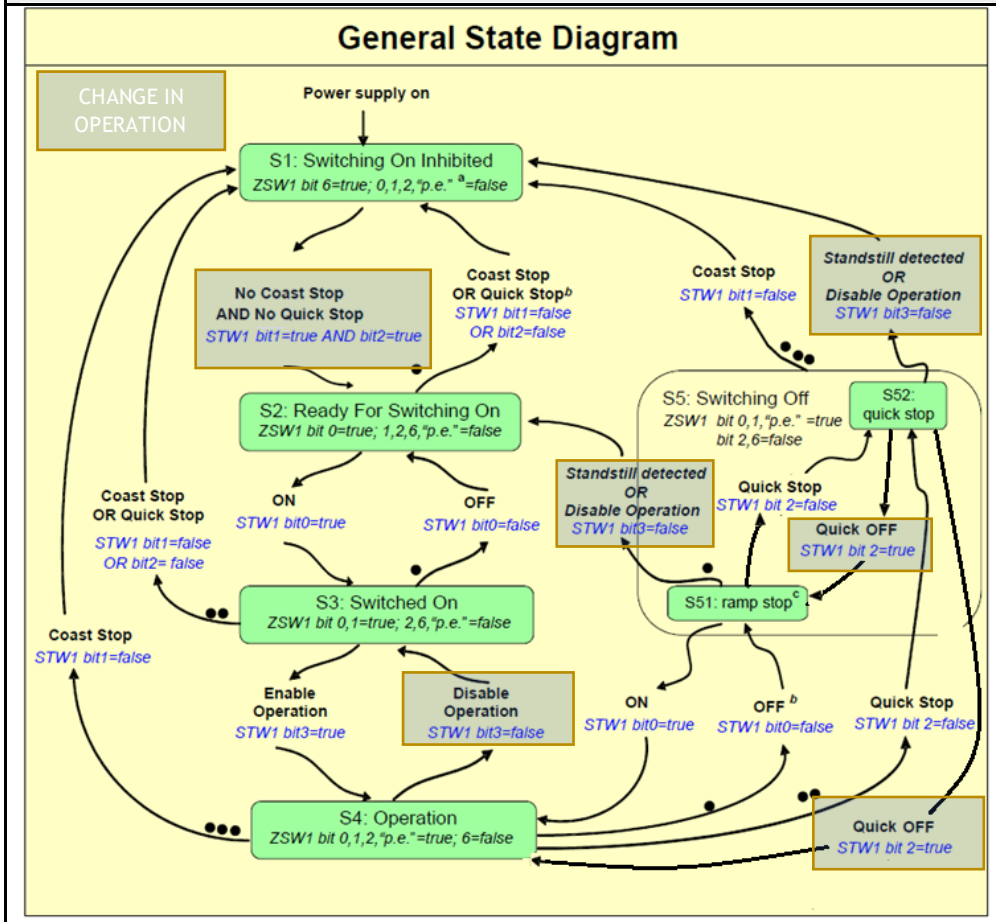
SmartWire-DT	ProfiDrive	Delta	DC1 3ph	DC1 1ph	DE1/DE11
STW1 bit2 0: No Quick stop 1: Quick stop ZSW1 bit 4 (Quick Stop) 0: Not Active 1: Active	STW1 bit2 0: Quick to stop 1: No Quick to stop ZSW1 bit 5 (Quick Stop) 0: Active 1: Not Active Once activated, Quick stop cannot be cancelled: S52 can only transition to S1	Command and status bit logic is inverted SmartWire-DT applications will need to update STW1 bit2 & ZSW1 bit5 logic to transition between states	PROFIdrive operation supported	PROFIdrive operation supported	PROFIdrive operation supported

2.4 ‘Ramp Disable’ (STW1 bit4)

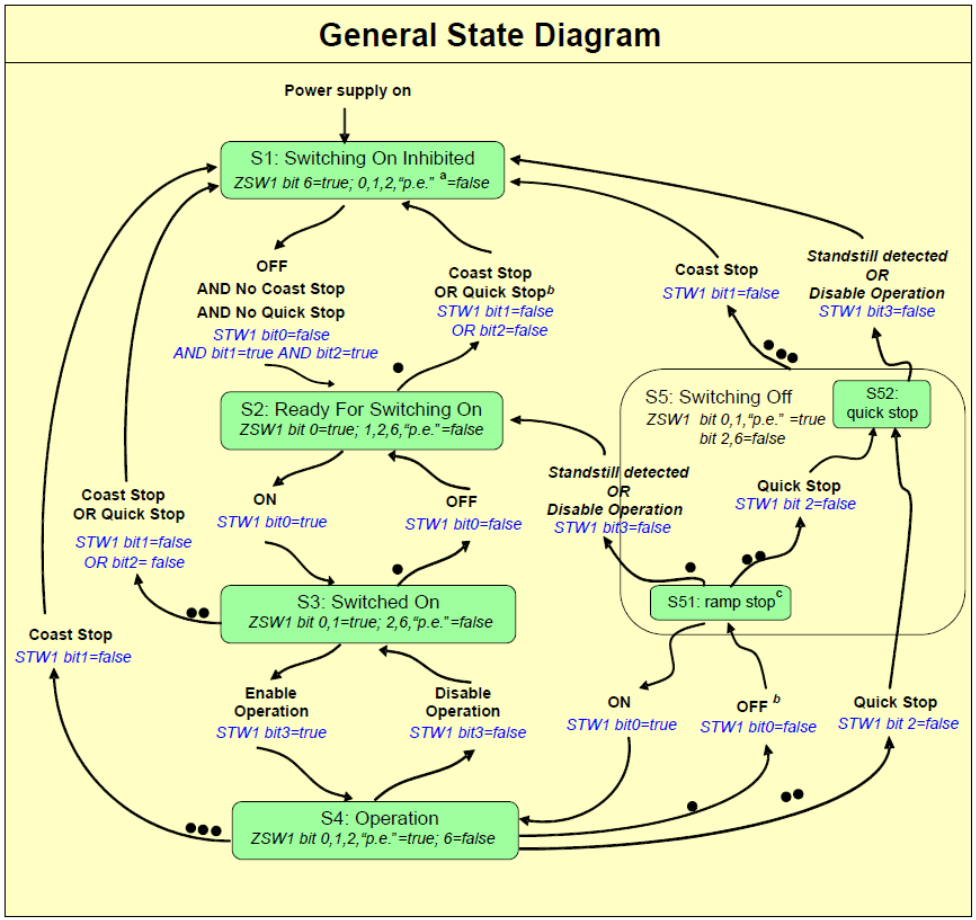
SmartWire-DT	ProfiDrive	Delta	DC1 3ph	DC1 1ph	DE1/DE11
STW1 bit 4: 0: Reset Ramp Generator 1: Enable Ramp Generator	STW1 bit 4: 0: Reset Ramp Generator 1: Enable Ramp Generator	Profinet (DC1 3ph Only) : Ramp disable (post ramp reference set to 0, drive ramp down by torque or voltage limit). SmartWire: DC1 3ph deceleration will now ramp along torque/ voltage limit SmartWire DC1 1ph and DE1: No change, ramped deceleration	ProfiDrive operation supported	Existing SmartWire-DT behaviour is still valid	Existing SmartWire-DT behaviour is still valid

3 State Machine

SmartWire-DT



PROFIdrive



3.1 S1->S2

SmartWire-DT	PROFIdrive	Delta	DC1 3ph	DC1 1ph	DE1/DE11
Transition from S1 to S2: No Coast and No Quick Stop (STW1 bit1=true & bit2 = true)	Transition from S1 to S2: OFF and No Coast and No Quick Stop (STW1 bit0 = false, bit1=true & bit2 = true)	STW1 Bit0 must be set to 0 (OFF) to transition from S1 to S2. SmartWire-DT application may not transition from S1 to S2 if PLC application does not set STW1 bit0 to false	PROFIdrive operation supported	PROFIdrive operation supported	PROFIdrive operation supported

3.2 S4->S3

SmartWire-DT	PROFIdrive	Delta	DC1 3ph	DC1 1ph	DE1/DE11
Transition from S4 to S3: Disable Operation (STW1 bit3 = false) Drive Ramps to zero speed as defined by P1-03	Transition from S4 to S3: Disable Operation (STW1 bit3 = false) Drive Coasts to zero speed.	S4 to S3 transition is now a coast operation SmartWire-DT application that transitions from S4 to S3 will coast to zero speed instead of executing current deceleration ramp as set by P1-04	PROFIdrive operation supported	Existing SmartWire-DT behaviour is still valid	Existing SmartWire-DT behaviour is still valid

3.3 S52 (Quick Stop)

SmartWire-DT	PROFIdrive	Delta	DC1 3ph	DC1 1ph	DE1/DE11
When in S52 (Quick stop) quick stop can be cancelled (STW1 bit 2 = true), returning drive to state S4 or S51	Once triggered, S52 (quick stop) cannot be cancelled and upon completion exits to S1	Quick Stop can no longer be cancelled.	PROFIdrive operation supported	PROFIdrive operation supported	PROFIdrive operation supported

3.4 Disable operation (S52->S1, S51->S2)

SmartWire-DT	PROFIdrive	Delta	DC1 3ph	DC1 1ph	DE1/DE11
Disable operation (STW1 bit3) initiates and ramp down to zero speed, as defined by P1-04	Disable operation (STW1 bit3) initiates and fast deceleration to zero speed.	Disable operation (STW1 bit3) triggers a fast deceleration independent of P1-04 SmartWire-DT application that transitions from S51 or S52 to S1 will fast stop to zero speed instead of executing deceleration ramp as set by P1-04	PROFIdrive operation supported	Existing SmartWire-DT behaviour is still valid	Existing SmartWire-DT behaviour is still valid

4 Fault Buffer

SmartWire-DT	PROFIdrive	Delta	DC1 3ph	DC1 1ph	DE1/DE11
PNU944, PNU947.x, PNU952, STW1 bit7 Fault Ack & ZSW1 Bit3 Fault Present.	PNU944, PNU947.x, PNU952, STW1 bit7 Fault Ack & ZSW1 Bit3 Fault Present. Same operation as SmartWire-DT with the addition of: • STW1 bit7 Fault Ack and increments PNU944 • ZSW1 bit 3 (fault present) indicates unacknowledged fault in PNU 947.0	Updated reaction to STW1 bit7 Fault Ack SmartWire-DT fault log operation will have minor changes which do not affect product operation	PROFIdrive operation supported	PROFIdrive operation supported	PROFIdrive operation supported

5 Parameter Settings

Parameter	Normal use		Certification	Effect on operation
	DC1 3ph	DC1 1ph	DC1 3ph	
P-03	>1s		8s	Correct execution of ramp operation between S51 -> S4
P-04	>1s		8s	Correct execution of ramp operation between S4 -> S51
P-05	0 Ramp to Stop	0 Ramp to Stop	0 Ramp to Stop	Correct operation of Ramp, Coast and Quick stop: S3-S1 S4->S1, S4-S3, S4-S52 S51->S52, S52-S1
P-18	-		2 Motor at Target Speed	Correct detection of ZSW1 bit 10 during certification
P-19	-		50%	Correct detection of ZSW1 bit 10 during certification
P-24	-		1s	Align actual quick stop time to testers quick stop tolerance bands

Parameter	Normal use	Effect on operation
	DE1/DE11	
P-03	>1s	Correct execution of ramp operation between S51 -> S4
P-04	>1s	Correct execution of ramp operation between S4 -> S51
P-05	1 Ramp to Stop	Correct operation of Ramp, Coast and Quick stop: S3-S1 S4->S1, S4-S3, S4-S52 S51->S52, S52-S1

P-12	Description
0	Local: Control and Setpoint via Terminal
9	Network: Control and Setpoint via Network
10	Control via PROFIdrive-Telegram – Local Setpoint
11	Control via Terminal – Setpoint via PROFIdrive-Telegram
12	Control and Setpoint via PROFIdrive
13	Dual Mode – Control and Setpoint via PROFIdrive-Telegram – Enable via DI1

DE1: P-12 = 3,4,5,9, … , 12

P-15	DI1 (Terminal 1)	DI2 (Terminal 2)	DI3 (Terminal 3)	AI1 (Terminal 4)
0	FWD	REV	Select f-Fix1	-
1	FWD	REV	EXTFLT	-
2	FWD	REV	Select f-Fix2	f-Fix 2
3	ENA	Select f-Fix1	EXTFLT	
4	ENA	UP	Select f-Fix1	DOWN
5	ENA	UP	EXTFLT	DOWN
6	FWD	REV	UP	DOWN
7	ENA	Select f-Fix2	EXTFLT	f-Fix 2
8	START	DIR	Select f-Fix1	-
9	START	DIR	EXTLFT	-

DC1: P-12 = 3,4,7, … , 13

P-15	DI1 (Terminal 2)	DI2 (Terminal 3)	DI3/AI2 (Terminal 4)	DI4/AI1 (Terminal 6)
0	ENA	-	-	-
1	ENA	-	-	-
2	ENA	-	-	-
3	ENA	Select BUS REF/f-Fix	EXTFLT	AI1 REF
4	ENA	-	-	-
5	ENA	-	Select f-Fix1 / f-Fix2	-
6	ENA	Select BUS REF/AI REF	EXTFLT	AI1 REF
7	ENA	Select BUS REF/Keypad RED	EXTFLT	AI1 REF
8	ENA	-	-	-
9	ENA	-	-	-
10	ENA	-	-	-
11	ENA	-	-	-
12	ENA	-	-	-
13	ENA	-	EXTFLT	-
14				
15	ENA	f-Fix1/Select BUS REF	Select Fire Mode/Normal OP	Pre-set speed 4/2
16	ENA	f-Fix4/Select Bus REF	Select Fire Mode/Normal OP	-
17	ENA	Keypad REF/Select BUS REF	Select Fire Mode/Normal OP	-

6 Acyclic Access

6.1 Octet string representation

SmartWire-DT	ProfiDrive
Length byte always set to 1, irrespective of the actual Octet String Length	Length byte indicates number of bytes contained within the Octet String

6.2 PNU952 Error code

SmartWire-DT	ProfiDrive
When writing of any value other than zero (reset cmd) returns code 02h: Low or high limit exceeded	When writing of any value other than zero (reset cmd) returns code 06h: Setting not permitted (may only be reset)

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