PowerXL

DE1 / DE11

Firmware Release Note

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Original Release Note is the English version of this document.

All non-English language versions of this document are translations of the original Release note.

Content

1 V2.0 Change Notification - 07.09.2017

Existing Version 1.04 (DE1) / 1.02 (DE11)
New Version 2.00 (DE1) / 2.00 (DE11), production starting serial#60694602001

Management Summary

We updated the firmware of DE1(1) for your convenience. The use of existing parameter sets can generally be continued. Only exception is a change in Modbus addresses (2.1). The following updates will improve handling and functionality of the drive.

1. **Functionality**

   1.1. **Extended Minimum Ramp Limit**   (/extended)

   P-03 (Default 5, Range 0.0-300s, PNU 111)

   P-04 (Default 5, Range 0.0-300s, PNU 114)

   The minimum values for the ramp have been reduced from 0.1s to 0.00s with fine resolution of 0.01s available between 0.00s and 0.09s.

   1.2. **Changed Boost Voltage**   (/changed)

   P-11 (Default 3.0%, [except DE1(1)-129D6…2.2 kW   P11   =   3.5%], Range 0-40%, PNU 27)

   Boost voltage parameter adjusted to more practical values, in line with DC1 performance.

   1.3. **Skip Frequency Functionality** (/new)

   P-42 (Default 0, Range 0.0-50Hz, SWD index 22.0) skip frequency bandwidth

   P-43 (Default 0, Range 0.0-50Hz, SWD index 21.0) skip frequency center point

   Enable and set skip frequency functionality.

   1.4. **Analog Input Offset** (/new)

   P-44 (Default 0, Range -250%-250%, SWD index 262.0)

   Set an analog input offset.

1.5. Fire Mode (/new)

1.5.1. Fire Mode Parameter (/new)

P-45 (Default 0, Range 0-4, SWD index 640.0)

0	Fire mode disabled
1	Fire mode active with FWD speed AI1 (change to PS4 if AI1 signal loss or at 0 on fire mode activation with no return to AI1)
2	Fire mode active with REV speed AI1 (change to PS4 if AI1 signal loss or at 0 on fire mode activation with no return to AI1)
3	Fire mode active with FWD speed PS4
4	Fire mode active with REV speed PS4

Fire mode only works if P-15 = 1, 3, 5, 7 or 9. Fire mode input is DI3 and active on signal low (NC).

1.5.2. Fire Mode Monitoring (/new)

P00-21 (SWD index 841.58370) is the fire move activation counter.

P00-22 (SWD index 821.11) is the fire mode total activation time.

1.6. Motor Stator Resistance (/new)

P-46 (Default depending on drive rating, Range 0-655.35, SWD index 218)

Adjust the motor stator resistance value. The default is in line with the performance of the existing firmware. Matching the stator resistance parameter with the actual motor stator resistance will improve motor control performance, especially the drive torque performance at low speed.

1.7. Improved Control Software (/new)

Enhancement of motor control library and improved reaction times for improved efficiency and motor handling.

1.8. Advanced set-up protection (/new)

For instantaneous output over current (O-I, hO-I) and motor thermal overload (it.trp), a time delay will protect the drive from damage. Delay times can be found below. In any case, the trips should result in an investigation and rectifying of the trip cause.

Trip#	Delay before reset possible
1	2 seconds
2	4 seconds
3	8 seconds
4	16 seconds
5	32 seconds
Subsequent	63 seconds

2. Modbus

2.1. Changed Modbus Address Option (/changed)

P-47 (Default 1, Range 1-255, SWD index 3221.0)

A dedicated Modbus address parameter P-47 with increased range has been added into this release, needed for Modbus communication instead of P-34.

When transfer parameter settings from older version drive into this new drive via DrivesConnect or DX-COM-STICK2, P-47 will be set to 1 (default).

If SWD module is used, this parameter must be set to 1.

2.2. Modbus Communication Data Format (/new)

P-48 (Default 0, Range 0-3, SWD index 3224.0)

0	1 start bit, 8 data bits, 1 stop bit, no parity
1	1 start bit, 8 data bits, 2 stop bit, no parity
2	1 start bit, 8 data bits, 1 stop bit, odd parity
3	1 start bit, 8 data bits, 1 stop bit, even parity

If SWD module is used, this parameter must be set to 0.

2.3. Changed Modbus Exception Code (/changed)

The Modbus exception code returned by drive when error happens during Modbus register write operation has been changed from "illegal function" to "illegal data value".

2.4. Enhanced Modbus Support (/new)

Support of two new Modbus function codes.

FC16: Write multiple registers, register 01 to 04 now support multiple write access with function code 16.

FC23: Read and write multiple registers, registers 01 to 30 are available for read while register 01 to 04 can be written at same time simultaneously.

3. CANopen (DE11 only)

3.1. Default Profile Change (/changed)

From the new release, the default PDO transfer type will be set to 255 (TX PDO transmission automatically on value change) coming from 254.

RX PDO transmission is not affected due to transfer type 255 has same behavior as type 254.

3.2. Enhanced CANopen Communication Baud Rate (/extended)

P-50 (Default 2, Range 0-5, PNU 3302)

Two new option have been added in P-50 for new CANopen communication baud rate selection:

P-50 = 4 gives 50kbps

P-50 = 5 gives 20kbps

New version DrivesConnect software is needed in order to display these two new options correctly.

3.3. Enhanced CANopen Control (/extended)

P-12 (Default 0, Range 0-13, PNU 928)

A new option 5 has been added in this new release for DE11 drive which allows ramp value to be modified via CANopen process data (cyclic messages).

2 V2.02 Change Notification - 26.04.2018

Existing Version 2.01 (DE1) / 2.01 (DE11)
New Version 2.02 (DE1) / 2.02 (DE11), production starting 26.04.2018

Change Description

Improvement of motor connected algorithm.

Regarding DE1 and DE11 low harmonics current controlled drives, there's a need for a motor-connected detection algorithm in order to disable the current regulation when no motor is connected or when a large drive/motor power mismatch exists. Failing to detect these situations can cause the drive to not be able to decelerate it, even when a stop command has been received. The enhanced motor-connected detection algorithm developed in v2.02 sw. addresses the problems reported from the field and provides a robust solution to the question when is correct to enable/disable our internal current regulation.

Production firmware V2.01 will be replaced by V2.02

Control board firmware will also be upissued to version V2.02 for consistency, although there is no change being made to the control board processor. Changes in this case all reside in the power stage.

3 V2.03 Change Notification - 25.07.2018

Existing Version 2.02 (DE1) / 2.02 (DE11)
New Version 2.03 (DE1) / 2.03 (DE11), production starting 25.07.2018

1.   CanOpen mapping to include motor voltage (DE11 only)

Added/mapped motor voltage to object 2048 (same as DC1)

2.   Modification of drive behavior when operating in Modbus control (DE1&DE11)

Change Description

Customers have the possibility to start the drive manually in the event of a failure of the Modbus communication and operate the drive with a preset speed.

The firmware changes has no impact existing customers, applications or compatibility. The solution is maintain backward compatibility.

Technical implementation

In order to achieve the required functionality, the following firmware change will be made.

- For all settings of P-12 <> 3, no changes are made
- When P-12 = 3, setting P-15 = 0 has the following function assigned in current firmware
  - DI1 = Stop / FWD Run Enable
  - DI2 = Stop / Reverse Run enable
  - DI3 = Select FF1
  - DI4 = Ref (Analog Input)
    - In this case, this actually has no function in today's firmware when P-12 = 3
    - Therefore, it is proposed that this function is changed as shown below
- All settings P-12 <> 3

Input	OFF Function	ON Function
DI1	Stop	Forward Run Enable depending on selected control mode
DI2	Stop	Reverse Run Enable depending on selected control mode
DI3	No Function	Select FF1 as Speed Reference
DI4	Analog Input Reference	

P-12 = 3 (Modbus RTU Mode)

Input	OFF Function	ON Function
DI1	Disable / Stop	DI4 OFF : Drive Enable. Control via Modbus DI4 ON : Drive Run Forward
DI2	Forward (Clockwise) motor rotation.	DI4 OFF : Drive Enable. Control via Modbus DI4 ON : Drive Run Reverse
DI3	No Function	Select FF1 as Speed Reference
DI4	Modbus RTU Control Mode	Terminal Control Override

Note : If DI1 & Di2 are activated together, drive will stop.

Drive Operation

- In the case of this customer, the settings used are P-12 = 3, P-15 = 0.
- In normal operation, the drive is control through Modbus RTU.
  - Either DI1 or DI2 must be ON to provide a hardware enable signal. Not both ON.
  - DI4 must be OFF to allow Modbus RTU control
- In the event of a loss of Modbus RTU communication, the drive will behave as configured by P-40 (Recommendation: Trip)
  - In this case, DI4 may be switched ON.
- When DI4 is ON, the drive will Run or Stop depending on the status of DI1 and DI2 directly. Modbus RTU Control Word is ignored.
- In addition, when DI4 is ON, the drive will ignore any loss of Modbus RTU communication.
  - In addition, DI3 must be ON to select FF1 as the speed reference.

4 V2.10 Change Notification - 08.08.2018

Existing Version 2.03 (DE1) / 2.03 (DE11)

New Version 2.10 (DE1) / 2.10 (DE11), production starting 08.08.2018

DE1(1) power module change

Current power module used in VSS S2 LV: 30-FSB-LV (FSBB30CH60D) was re-placed with 30-FSB30-E3 (FSBB30CH60DF). The only difference between new and old part is regarding the feedback range from the Internal thermistor compo-nent. To accommodate this a firmware update was necessary to apply new scaling to the raw input from the thermistor to give an accurate temperature reading.

The new version firmware has revised power module thermistor scaling for the VSS S2 LV models due to this change in the hardware. All other features and function-ality remain the same as previous (V2.03). Although it is only the LV S2 units that require the change, the firmware version of all models are changed for consistency and to prevent issues of backward compatibility. Note that units prior to V2.10 can only be updated to firmware level V2.03. Units post V2.10 will only be permitted to be downgraded to V2.10. Version control is via the firmware update function with drivesConnect.

5 V2.20 Change Notification – 12.10.2022

Existing Version 2.10 (DE1) / 2.10 (DE11)

New Version 2.20 (DE1) / 2.20 (DE11)

1. **Add P-57 and P-58 Ethernet Cyber Security**
   We now add two cyber security related parameters for Ethernet based plug-in Module:

   P-57 Cyber security option:

   Range 0 to 7. Default value 0 (all function disabled) Option definition:

   0000b: All services disabled off

   xxx1b: Webserver enable

   xx1xb: TFTP/FTP server enable

   x1xxb: Reserved (Diagnostic interface enable)

   P-58 Cyber security reset time:

   Range 0 to 60min. default is 10min

   If set to 0, then cyber security settings will not change. Otherwise, the cyber security option in P-57 will be reset to 0 after time delay defined by P-58.

2. **Add support to DX-Net Profinet Module**
   The following support has been added to the drive in order to support new DX-Net Profinet module:

   1) Communication protocol updated to support new profile 1 and 12 in addition to current existing SWD profiles.
   2) Control and status words mapping and function has been updated according to the latest DX-Net Profinet specification. Please note that this does affect current SWD operation.
   3) Parameter P-34, P-35, P-36, P-40, P-47, P-48 and P-50 (DE11) will be locked when drive is running. So they can only be edited when drive is not running. Please note that current keypads may not show these parameter as locked during running, however any changed value will be rejected by the drive.
   4) Add PNU 60000 support.

3. **Fix an issue where CANopen heartbeat message missing occasionally (DE11 only)**
   In previous release, the heartbeat message generated by drive can occasionally missing one cycle from its normal interval that set by user in Object 0x1017h. This issue has now been fixed.

4. **Add option 10 to P-15 (DE11 only)**
   A new option 10 has been added to P-15.

   P-15 = 10 : START/SOURCE/FF1/REF

   For terminal control (P-12=0) and SWD control (P-12>=9):

   DI2 has no function, DI3 can be used to select FF1.

   For Modbus (P-12=3) and CANopen (P-12=4 or 5):

   If DI2 is open, drive will be controlled by fieldbus master, communication loss control function as normal as defined in drive parameters.

   If DI2 is closed, drive will be controlled by DI1 (RUN) and speed reference is from analog input. Communication loss function will be disabled.

   When DI3 is closed, speed reference will be fixed at FF1 (this overrides fieldbus speed reference and analog input 1 speed reference).

   For Keypad control mode:

   If DI2 is closed, drive will be controlled via DI1 instead START/STOP button. DI3 is used to select FF1.

   Please note that this new option won't be supported by DEX-EXT-SET module.

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