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Software Change Note
ARFIF106

Grid Converter
+
General Grid Code

Application: ARFIF106
Application Name: Grid Converter + General Grid Code
Verbal Name: GC + GGC
Manual: DPD01978A

Note 1: Frame size FR4 will be operational in uGrid and Island mode without a license key but this frame size is only for testing and demonstration purposes, not for real production. See full requirements from latest "GTC Product compatibility note (V110)".

Note 2: Grid Code functionality requires license regardless of the unit size.

Note 3: Grid Code functionality requires that OPT-D7 option board is used and activated by P2.7.2 AFE Options 1 B13.

Update Note 1: When updating application it's not recommended to use NCDrive parameter download function. Instead upload parameters from the unit and make compare to old parameter file. Application is constantly developed; this includes changing parameter default values, and if parameters are directly downloaded to drive improved default values will be lost.

ARFIF106V062

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Replaced Application:	ARFIF106V059
Used Firmware version:	NXP4.90
System Software requirement:	NXPV195
Released to field:	-
Used in production:	**-**
Changes in new application:	

- Tripping to individual phase voltages is moved being Grid Code Options B1

- Few default values changed for Grid Code to allow easier commissioning.

ARFIF106V059

Replaced Application: ARFIF106V056
Used Firmware version: NXP4.90
System Software requirement: NXPV195
Released to field: 6.8.2018
Used in production:
Changes in new application:

- Added offset parameters for Grid Code monitored voltage.
    - Offset for Stop state
    - Offset for Run state
- High Frequency Power limit is not limited by given corner values.
    - Power limited linearly when frequency increases more than set value.

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ARFIF106V056

Replaced Application:	ARFIF106V055
Used Firmware version:	NXP4.90
System Software requirement:	NXPV195
Released to field:	
Used in production:	
Changes in new application:	

- Anti-Islanding delayed 500 ms when started.

ARFIF106V055

Replaced Application: ARFIF106V048
Used Firmware version: NXP4.90
System Software requirement: NXPV195
Released to field:
Used in production:
Changes in new application:

- Minimum and maximum of individual main voltages are also monitored for Grid Code trip.

- F10 Line Synch fault disables when Grid Code functions are active.

- FRT active status to Line State B13

- Added 35 ms filtering to monitored frequency for Grid Code functionality.

- Power Follower hysteresis decreased to 3 %.

- Double Sampling active by default, disable CO2.B6.

- RegenCapSize compensation increase when negative power and negative CosPhii.

- F2 Over Voltage will open MCB immediately.

- Minimum reconnection time set to 1100 ms.

- Added Ramp function for power reference function.

- Ramp Down function for power when stop command is given.

- Power increase function added for low frequency.

ARFIF106V048

Replaced Application: ARFIF106V046
Used Firmware version: NXP4.90
System Software requirement: NXPV195
Released to field:
Used in production:
Changes in new application:

- Process Data handling moved to 10 ms time level from 20 ms time level.

- Grid Code stop request will open MCB

- Added 50 ms delay to MCB Open state when no feedback from MCB.
    - MCB opening was happening faster than stop command, resulted in F64 A4 fault.

- Added Active Start Command status to Status Word B11, B12 goes down if Grid Code functions request a stop.

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ARFIF106V046

Replaced Application: ARFIF106V045
Used Firmware version: NXP4.90
System Software requirement: NXPV195
Released to field:
Used in production:
Changes in new application:

- The application now supports 16 fieldbus process data variables.

  o Settings for PD 9-16 are visible if a fieldbus board with support for 16 PD is inserted in option board slot D or E.

  o PD variables 9-16 can be enabled by setting an appropriate value for parameter P2.10.38 'Control Slot Selector'.

ARFIF106V045

Replaced Application: ARFIF106V043
Used Firmware version: NXP4.90
System Software requirement: NXPV195
Released to field:
Used in production:
Changes in new application:

- Voltage Low Limit Warning limit for stopping the drive is only possible in AFE mode. See Control Options 1 B11.

ARFIF106V043

Replaced Application: ARFIF106V039
Used Firmware version: NXP4.90
System Software requirement: NXPV195
Released to field:
Used in production:
Changes in new application:

- Power Ramp Rate is freezer during LVRT.

- Power Lock Low Voltage Reactive injection was stopping injection before reaching Lock Out Voltage Level, fixed.

- Power Lock High Voltage Reactive injection was stopping before reaching Lock Out Voltage Level, Fixed.

- Power reference will be 3 % smaller than a limit in case limiting, but not less than a zero.

- Added Lock Out Power parameter for High Voltage reactive injection for linear injection.

- FRT Enable has now selection

    o Disabled; Both curve and level will trip

    o Enabled; Voltage level will trip

    o Enabled; Curve will trip

    o Enabled; Neither will trip

- Added Control Options 2 B6; Double sampling

    O Reduces current measurement aliasing, needed e.g. in battery system when zero current reference needs to be accurate.

- Added Current Measurement offset identification.

- Possible to scale Capacitor Size based on Line Voltage.

- Power Follower hysteresis is also included in High Frequency Power limit trigger.

- Power limit that is given by Grid Code function block is no longer voltage compensated.

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ARFIF106V039

Replaced Application: ARFIF106V030
Used Firmware version: NXP4.90
System Software requirement: NXPV195
Released to field:
Used in production:
Changes in new application:

- Grid Converter grid protections were active while Grid Code functions were used.
    - F70 Supply Voltage
    - F92 D7 Voltage
    - F91 Short Circuit
- If FRT function is used drive will use G2.17.9 Volt. Dip Time for stopping the modulation.
- Two Phase trip time was using three phase voltages for trip time calculation, fixed.
- Functions monitoring active current will see motoring active current as zero.
- Over Voltage reactive slope format was wrong, fixed #,# -> #,##
- Active Current Reference is limited by Active Current Limits to reduce over shoot in PI controller.
- Power Follower hysteresis increased from 2 % to 5 %.
- On reconnection Grid Converter limits has priority for 400 ms, sixed to follow Grid Code limit when Grid Code functionality is active.
- Certain specific setting was giving reactive current while Reactive Current Injection was not active, fixed.
- Added AFE Options 3 parameter
- Tripping to Frequency Change Rate was not making reconnection, fixed.
- Power PI Controller freeze during LVRT.

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ARFIF106V030

Replaced Application: ARFIF106V029
Used Firmware version: NXP4.90
System Software requirement: NXPV195
Released to field:
Used in production:
Changes in new application:

- PI-Controller added for uGrid mode reactive reference.
    - Disabled when voltage controller or island mode is active.
    - User needs to disable reactive controller if true island but drive operating in uGrid mode.
- Added Output Power Limit as a monitoring value.

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ARFIF106V029

Replaced Application: ARFIF106V028
Used Firmware version: NXP4.90
System Software requirement: NXPV195
Released to field:
Used in production:
Changes in new application:

- Symmetrical reactive injection parameter did not work, fixed.
- Added Grid Code Options parameter.
    - B01: Faster reactive injection, needed only to certain grid code standards.

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ARFIF106V028

Replaced Application: ARFIF106V025
Used Firmware version: NXP4.90
System Software requirement: NXPV195
Released to field:
Used in production:
Changes in new application:

- Changes in DataLogger default signals.
- Added parameter to enable symmetrical current injection.
- Added power increase rate limiter function.
- Adde High Voltage Power limit functions.

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ARFIF106V025

Replaced Application: ARFIF106V021
Used Firmware version: NXP4.83
System Software requirement: NXPV194
Released to field:
Used in production:
Changes in new application:

- Connection to power unit is confirmed before checking license.
- Pulse MCB control was giving in power up opening command, fixed.
- Added function to start with Grid Voltage -> Zero Q start.
- Added function to keep zero reactive power -> Keep Zero Q

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ARFIF106V021

Replaced Application: ARFIF106V019
Used Firmware version: NXP4.83
System Software requirement: NXPV194
Released to field:
Used in production:
Changes in new application:

- MCB close command was given before correct closing level was updated. Added function to verify that close level is correct.
- MotPot function for reactive current reference was running even if maximum limit was reached if DIN was active, fixed.
- Added parameter to limit Reactive Current reference given by MotPot function.
- MotPot function for Voltage reference was running even if maximum limit was reached if DIN was active, fixed.
- Possibility to bypass normal maximum DC-Link voltage reference level with Control Option B10.
    - This is only for momentary use, not to be used for continues reference.

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ARFIF106V020

Replaced Application: ARFIF106V019
Used Firmware version: NXP4.83
System Software requirement: NXPV192
Released to field:
Used in production:
Changes in new application:

- Added Dynamic Support Kp parameter.
- Added Synch Kp parameter.
- Added Synch Ti parameter.
- Moved Active Current Kp and Ti parameters to different group
- Moved Synch Kp Start to different group
- Added DC Voltage Kp and Ti parameters.

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ARFIF106V019

Replaced Application:	ARFIF106V016
Used Firmware version:	NXP4.83
System Software requirement:	NXPV192
Released to field:	
Used in production:	
Changes in new application:	

- Added inversion parameter for PI Power controller for AFE mode.
- Removed unsupported Master-Follower modes.

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ARFIF106V016

Replaced Application: ARFIF106V015
Used Firmware version: NXP4.83
System Software requirement: NXPV192
Released to field: 14.2.2017
Used in production:
Changes in new application:

- Active current limit change to Power limit and function so that voltage changes are compensated
- Reset datalogger parameter was shown wrong in the monitor
- Added PI controller for power in AFE mode.

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ARFIF106V015

Replaced Application: ARFIF106V
Used Firmware version: NXP4.83
System Software requirement: NXPV192
Released to field:
Used in production:
Changes in new application:

- Grid Code Fault Sub codes had offset, fixed.
  - A1 is Grid Code license fault sub code.

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ARFIF106V006

Replaced Application: First Test Release
Used Firmware version: NXP4.83
System Software requirement: NXPV192
Released to field: 13.4.2016
Used in production:
Changes in new application:

- Only for testing purposes.

    o No manual, only parameter list.

    o Only for functionality comments purposes.

- Below Grid Codes should be possible to fulfill with correct parameter settings:

    o VDE 0126-1-1
    o VDE AR-N-4105
    o BDEW 2008
    o EN 50438
    o Decret Arrete 23.4.2008
    o CEI 0-21
    o CEI 11-20
    o R.D. 1663/2000
    o EN 50438
    o AS 4777.3
    o IEC 62116
    o CEI 0-16 / 17. TERNA
    o CEI 0-16 + A70
    o P.O. 12.2/12.3
    o CGC/GF 001:2010
    o AS 4777.3
    o BDEW 2008
    o CEI 0-16 / 17. TERNA
    o CEI 0-16 + A70
    o CGC/GF 001:2010
    o G59
    o IEEE 1547