Release Notes

Central-I, integrated and standalone controls and drives

Version 1.6.0.0

Doc revision: 0.2

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1 Release Information

Release Date:	7/03/2022
Released FW version	1.6.0.0
FPGA version	1.17.1, 2.3.0, 2.5.0, 4.0.1 (see table 1)
Boot version	1.013
PC Suite version	10.7.0
AAComm version	4.15.1.0
Related Products	Central-i: AGA800, AGA101/102/103, AGA155, Standalone: AGD200, AG301, AGC300, AGC301, AGD155
Release file's location	TBD

Product	FW Rev.	FPGA Rev.	HW Rev.	Boot FW Rev.
AGC300-ET	1.6.0.0	1.17.1	Rev 3,4	1.013
AGC301-ET	1.6.0.0	2.3.0	All	1.013
AGD155-AF-xx	1.6.0.0	2.5.0	All	1.013
AGD200-ET-xx	1.6.0.0	1.17.1	Rev 3,4	1.013
AGD301-ET-xx	1.6.0.0	2.3.0	All	1.013
AGM800-CI	1.6.0.0	NA[1]	All	1.013
AGA101-CI-xx	NA[2]	4.0.2	All	NA[2]
AGA102-CI-xx	NA[2]	4.0.2	All	NA[2]
AGA103-CI-xx	NA[2]	4.0.2	All	NA[2]
AGA155-CI-xx	NA[2]	4.0.2	All	NA[2]
AGI001-CI-1608	NA[2]	4.0.2	All	NA[2]
AGI002-CI-3216	NA[2]	4.0.2	All	NA[2]
AGL101-CI	NA[2]	4.0.2	All	NA[2]
AGL102-CI	NA[2]	4.0.2	All	NA[2]

[1] – AGM800 FW file include FPGA image
[2] – Central-i amplifiers, adapters and I/O modules requires only FPGA image

Table 1- Versions' matrix

2 New Features

Feature	Products affected
CNC mode enhancements: ▪ Added support for additional CNC engine - CNCB. Now AGM800 support two independent CNC engines – CNCA and CNCB in one controller. The user can define two groups of axes per CNC engine and execute two CNC sequences independently. ▪ Added New keyword: CNCASpeedPer (CNCBSpeedPer). A factor (in percent) to apply on the CNC Speed (in addition to CNCAPercents). It affects the CNC velocity only (not acceleration and deceleration). ▪ At CNC, if the segment is too short to decelerate to its end speed, the velocity reference is not jumping, but a new deceleration is calculated (higher than the user defined) and is used till the end of this segment. ▪ Adding CNCA and CNCB position reference filters. ▪ New segment added to CNC motion: Modify CNC Position Filter	AGM800
Added support for Position- Time trajectory interpolated mode. Linear, cubic, and parabolic spline interpolation are supported. In this mode position data vs time stored in internal buffer, that allows coordinated motion between multiple axes. Position profiles can be executed on each axis defined in group.	AGM800
Added support for CurrDir parameter to invert direction of motor and current. It allows invert physical motor direction without changing wiring.	AGDxx, AGM800
Motor stuck protection is deactivated for stepper motor types	AGDxx, AGM800
Add support for for LockSrc for bi-directional I/O #1 to #8. In previous version LockSrc is supported only up to bidirectional IO #2	AGD301
Updated gearing mode definitions, gear input (master) can be defined by parameter as auxiliary encoder or as encoder port for next axis or section of data in ECAM table.	AGDxx , AGM800
Add support for Tacho velocity feedback (as analog input) and Dual Loop based support based on Tacho input.	AGDxx , AGM800
Open loop current command increased to 14A (in previous version was 12A)	AGD155
For error mapping, adding a new keyword: MapErrOffRamp. The offset of the error mapping (a value set by the user and is added to the error from the table) is not affecting immediately but gradually. To avoid motor jump.	AGDxx , AGM800
Added support to initialize controlled stop by means of discrete input. It can be used as E-stop input to stop the motor according to emergency deceleration rate	AGDxx , AGM800

Velocity bi-quad filter moved to the forward loop. Not expected change in control performances. In very high demanding applications (fast responses), user may see improved performance. Another difference is that Vel [1] (before it was after the filter) is now showing like Vel [2] (derivative of the position), meaning with the noise. But this is just visual and anyway the default for graphs was Vel [3] which remains unchanged	AGDxx , AGM800
Force mode enhanced: Added two new keywords: CurrPosTh and CurrPosThDir. Trigger switching to current or to force modes from position mode is now ANDed with this new condition (Position must pass the threshold).	AGDxx , AGM800
Burn in mode (and two new keywords: BurnInMode, BurnInFreq). Used for amplifiers internal production tests	AGDxx , AGM800
Number of velocity Bi-Quad filters increased to 4.	AGDxx,AGCxx, AGM800
New keyword: CanMotorOnRes. Holds the returned value of CanMotorOn. CanMotorOn does not return a value anymore.	AGDxx,AGCxx, AGM800
Auto Phasing Learn changes CurrDir when needed instead of EncDir to simplify and support all feedback types	AGDxx, AGM800
Add new keyword: ClearIntegral. Clears the velocity PI integral.	AGDxx,AGCxx, AGM800
For error mapping, adding a new keyword: MapErrOffset. This value is added to the error from the table.	AGDxx,AGCxx, AGM800
In Gantry mode, if one of the motors is disabled, the other one is also disabled.	AGDxx,AGCxx, AGM800
Position events by hardware table implemented. When pulse is fired, it will trigger a background loop to inquire event counter and event next position register	AGDxx,AGCxx, AGM800
For AGD301: increased the size of many array parameters. UserParam size, 50 to 250 GenArray, 1000 to 5000 RecArray from 16500 to 30500 CNC FIFO Size, from 1500 to 5000	AGD301
UserParam array increased from 50 to 250 for AGM800.	AGM800
Added support for EncDir for absolute encoders.	AGDxx,AGCxx, AGM800
New keyword: PosBeforeMap. Showing the position before the error mapping. Nice for debugging and sometime may be needed for the customer	AGDxx,AGCxx, AGM800
Support for CanMotorOn new keyword.	AGDxx,AGCxx, AGM800
PosErr is forced to zero in non-Position Operation Modes.	AGDxx,AGCxx, AGM800
UPM Repetitive feature is now implemented (recommended for AGM800 only).	AGM800

Analog inputs are sampled @61us and the analog filter cutoff frequency increased to 8000Hz. Default: 1000Hz.	AGD155
Incremental encoder emulation direction control.	AGDxx,AGCxx, AGM800
PeakTime is limited to 1500	AGA155, AGD155
Support for 12 threads at user program.	AGM800
Support for ChooseAxis per thread. ChooseAxis[last thread + 1] is for communication and any none-user program usage.	AGM800
HomingStep keyword added, reporting the executed step when homing is executed and the last executed step once homing completes.	AGM800
New DInMode functionality (25) that starts homing sequence.	AGM800
Added support EnDAT 2.2 36 bit	AGAxx , AGM800
Enhanced current sensing mechanism	AGA155,AGA103
Enabled Safety feedback output	AGA102
Enhanced lock and capture accuracy for SinCos encoders	AGAxxx
Added support for HW revision with 4K FPGA	AGA102,AGA101
Added support for encoder emulation output for absolute encoders	AGD155
Added Support for auxiliary encoder for AGD155 (incremental only for now)	AGD155

3 Fixed issues

Fix	Products affected
ConterUp[] and CounterDown[] are now both counting up/down every 61us. In previous versions CounterUp[] increased by one every 976us and CounterDown[] decreased by 16 every 976us.	AGDxx ,AGCxx AGM800
Fixed issue with analog output rollover.	AGDxx ,AGCxx AGM800
Central-i Event counter is now incrementing when a pulse is fired (for event table type)	AGDxx ,AGCxx AGM800
Endat 2.2 clock output increased to 2MHz to resolve VelRef update issue	AGAxx,AGDxx
Updated current rating values for all AGAxx amplifiers	AGAxx
Fixed issue with SinCos encoder disconnection detection	AGD155,AGD301
Fixed clock for Pulse and Direction input filter to be 40MHz	AGD155,AGD301
Fixed issue that sometimes motor stuck fault occurred during auto-phasing	AGDxx,AGCxx, AGM800
Position Event Counter changed from 16 bits to 32 bits	AGAxx
Encoder filter fixed – Bug injected at 2.4.0 causing Incremental filter to be ineffective	AGAxx
AGL101 Digital Input 5 & 8 swap fixed	AGL101
AGL102 Analog Input 1 & 4 swap and Analog input 2 & 3 swap fixed	AGL102
AGA102 VBus reading at 128v if VBus supply is disconnected while Vlogic supply is still connected	AGA102

4 PCSuite and AAComm revision history

Feature/Fix
User interface for new features 1.6.0.0 support: - New Ultra precision mode - “Repeated Motion" - Support for FPGA update for central-I remote units - Open loop current tuning - Spline Buffer Motion - Support for CurrDir (current direction) - Tacho feedback and Tacho dual loop support - Dual loop - Lock/Event updates - CNC: CNCB engine, position filter
UI Enhancements: - Manage/Params: Add "reset to controller defaults" section + UI improvements - IO's: Display a HW Info line (describing IO's pins, connectors, etc.) Added connector and pin# near every I/O. - PCSuite 'Splash Screen' on start-up - Tools/Homing - Feedback/Event screens - Config/Ci: Add statuses for Comm, Amp., Variant and FPGA Size versions - New PCSuite and Viewer background - Tune/Gantry - Floating windows (I/O, Analog inputs, Algorithms Statuses) - Improved 'Temperature' display (i.e. "NA", STO disconnected)
IDE+ enhancements: - Auto-complete for 'P' axis - Allow use of #define as ranged #definevar indexer (MyVar[MyDefine]=17) - Notify on not-implemented trigonometric functions - Allow up to 12 user program threads statuses - Support hover over thread-related 'P' axis keyword

General updates:

- FPGA version to Upload Parameters file
- Extend FW/FPGA mismatch indication (Support for UnitStat bits[1,2])
- Config/Feedback: Support for EncAbsMB and EncAbsOff
- Tune/PIV: Add protections and fallback for PIV/PID conversions
- Support new ComtAng units
- Manage/FW: Special handling for currents validation while in BOOT mode
- Tune/Curr: Don't stop auto-data-rec on "Apply All" clicks
- Discrete IO: Align number of AGA102, AGA155, AGL101, AGL102 remote units IO's
- Tune/Phase: Restore "Minimal jumps search" phasing mode
- Tools/Homing: Add HomingStep status
- Manage/COM: Improve connectivity statuses
- Tools/Homing: Update 'predefined homing sequences' files
- Tune/Curr: improve PI calculation for AGD155
- Charter: add "Vertical AND Horizontal" markers
- Enhanced Slow Logger precision and memory handling. Increase log upload rate
- Enhanced support for Chinese language
- Add FW/FPGA compatibility validation
- Tune/Force: Update "on the fly mode switching" logic (from Position to Current or to Force)
- Discrete Inputs: add "25 - Homing On" DInMode value
- CNC G code converter: support "G01-04" syntax - the extra "zero"
- Tune/Phase: remove "Minimal jumps search" phasing mode

Bug fixes:

- Tools/Homing: Fix 'Save-As parameters file' functionality
- Statuses sometimes stop refreshing
- Tools/Homing: Timeout at steps 13 - 16
- Discrete IO's: Allow up to 32 inputs (for AGIO02)
- Analog Inputs: Refresh issue when reconnecting to a Master remote unit
- AGM400: increase reset time for proper reconnect
- Motion and Tune PTP control: send AccelFact on move abs/rel button clicks
- Manage/Params: Params DL got stuck if Disconnected in middle of DL
- Tune/Auto Phase: Crash on tool navigation if already connected
- Tune/Gantry: Fix an axis-related bug in the PTP tab
- HWProtectBits statuses refresh
- allow negative values at PD input factor

5 Known issues, limitations, and restrictions

Topic	Products affected
AGM400 is limited to support only 3 axes due to computing power limitation. Its recommended use AGM800 for any new design. AGM400 will be declared as obsolete in December 2021.	AGM400
In AGA155 reduce number of Input from 20 to 16. change input 16 to input 12, lock source support for input 3 to input 14. Not backward compatible to FPGA rev3.xx and earlier	AGA155
AGA102 Bi-Directional IO moved from bit 9 to bit 8	AGA102

6 FW and FPGA update procedure

Before FW update its recommended to backup controller parameters and user program on local disk.
User program will not run after FW update and shall be downloaded to controller after the update procedure.

6.1 Central-I controls and remoted update procedure:

Central-I AGM800 master FW update procedure:

- Table 2 defines FW file per AGM800 controller P/N and revision. AGM800 requires only FW update, the file name in the table below.

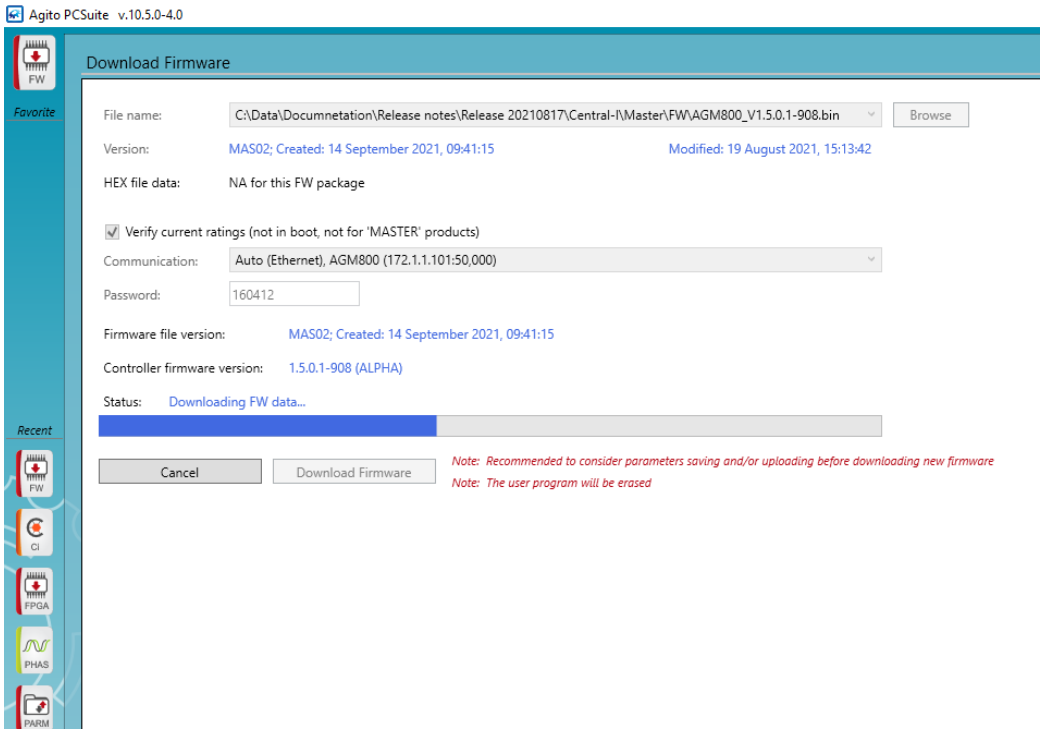
	P/N	FW File name
AGM Central-i Controller	AGM800-CI	AGM800_V1.5.0.1-908.bin

Table 2- AGM800 FW files

To update FW:

- Press “Manage” button and select “FW:

- Chose FW file name according to Table 2, the file shall be copied to local disk.
- Select “connection”, by default it will be Auto (Ethernet), AGM800 (172.1.1.101:50,000)
- Set Password: 160412
- Press Download FW button



Central-I remote units update procedure

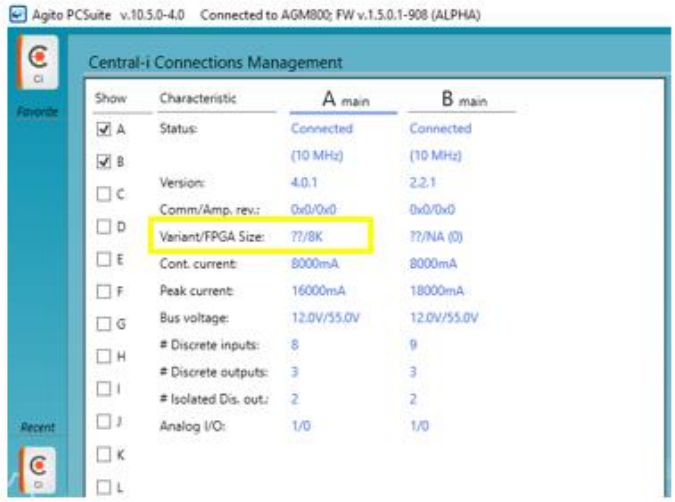
- Table 3: Defines FPGA file per product and its HW revision and FPGA size. Central-I remote units require only FPGA update, the file name shall be selected according to table below.

	P/N	HW Rev	FPGA size	FPGA file name
AGAxxx Central-i Remote Amplifier	AGA101-CI-xx	Amp: R1 Comm: R2	4K	AGA101_4K_AmpR1_CommR2_v4.0.1.rpd
	AGA101-CI-xx	Amp: R3 Comm: R2	4K	AGA101_4K_AmpR3_CommR2_v4.0.1.rpd
	AGA101-CI-xx	Amp: R1 Comm: R2	8K	AGA101_8K_AmpR1_CommR2_v4.0.1.rpd
	AGA101-CI-xx	Amp: R1 Comm: R3	8K	AGA101_8K_AmpR1_CommR3_v4.0.1.rpd
	AGA101-CI-xx	Amp: R3 Comm: R3	8K	AGA101_8K_AmpR3_CommR3_v4.0.1.rpd
	AGA102-CI-xx-004	all	4K	AGA102_4K_v4.0.1.rpd
	AGA102-CI-xx	all	8K	AGA102_8K_v4.0.1.rpd
	AGA103-CI-1D03	all	8K	AGA103_8K_v4.0.1.rpd
	AGA155-CI-2A06	all	8K	AGA155_8K_2A06_v4.0.1.rpd
	AGA155-CI-2A10	all	8K	AGA155_8K_2A10_v4.0.1.rpd
AGIO Central-i Remote I/O	AGIO01-CI-1608		4K	AGIO01_4K_v4.0.1.rpd
	AGIO01-CI-1608	Comm: R2	8K	AGIO01_8K_CommR2_v4.0.1.rpd
	AGIO01-CI-1608	Comm: R3	8K	AGIO01_8K_CommR3_v4.0.1.rpd
	AGIO02-CI-3216	all	4K	AGIO02_4K_v4.0.1.rpd
AGL Central-i Link / Adapter	AGL101-CI	all	4K	AGL101_4K_v4.0.1.rpd
	AGL102-CI	all	4K	AGL102_4K_v4.0.1.rpd

Table 3-Central-i remote units version files

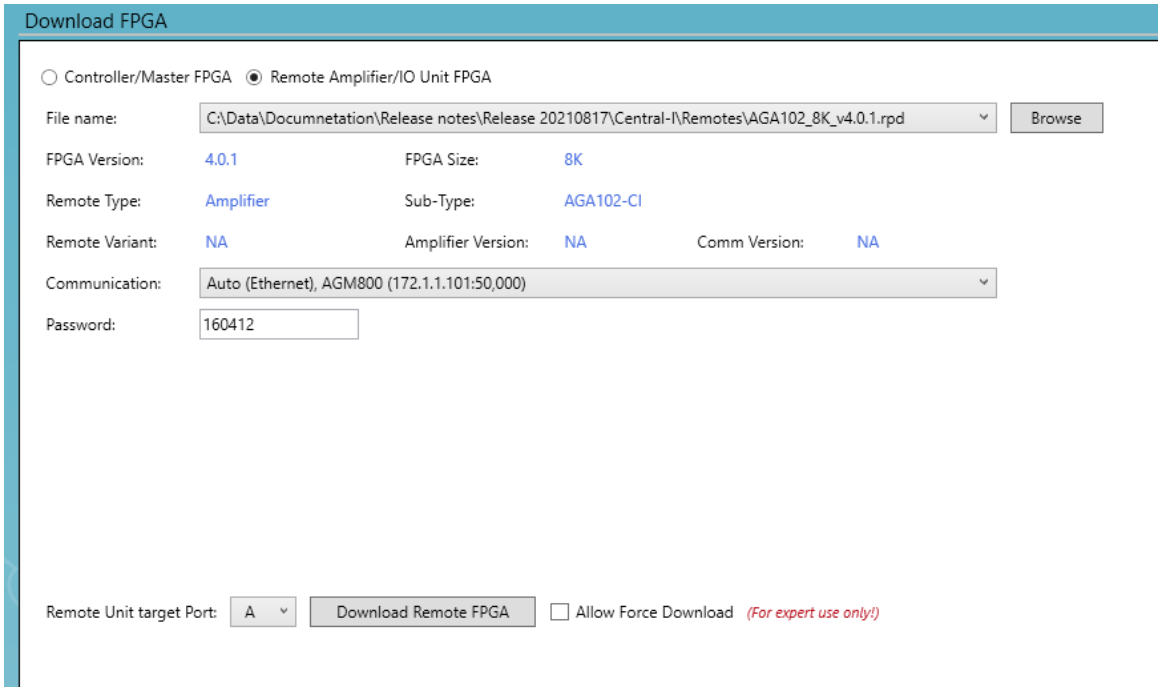
To update FPGA:

- First step is to identify the HW revision and FPGA size in the unit that will be updated.
- Revision and FPGA size can be seen in Central-I connection management screen for newer versions.

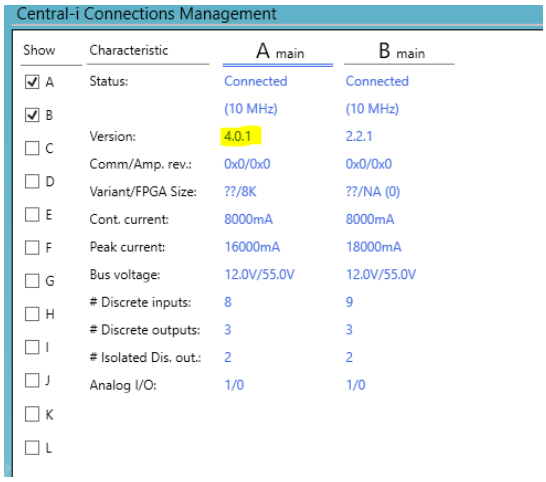


- If the revision and FPGA size not displayed. The information can be found on product label.
- Press “Manage” button and select “FPGA:

- Select “Remote Amplifier / IO unit FPGA” radio button
- Chose FGPA file name according to Table 3, the file shall be copied to local disk.
- Select “connection”, by default it will be Auto (Ethernet), AGM800 (172.1.1.101:50,000)
- Set Password: 160412
- Select Remote Unit target port
- Note: If revision and FPGA not identified by PCSuite, check “Allow Force Download”
- Press Download “Remote FPGA” button



Verification of FPGA version can be done in Central-I connection management screen.



6.2 Standalone controls update procedure:

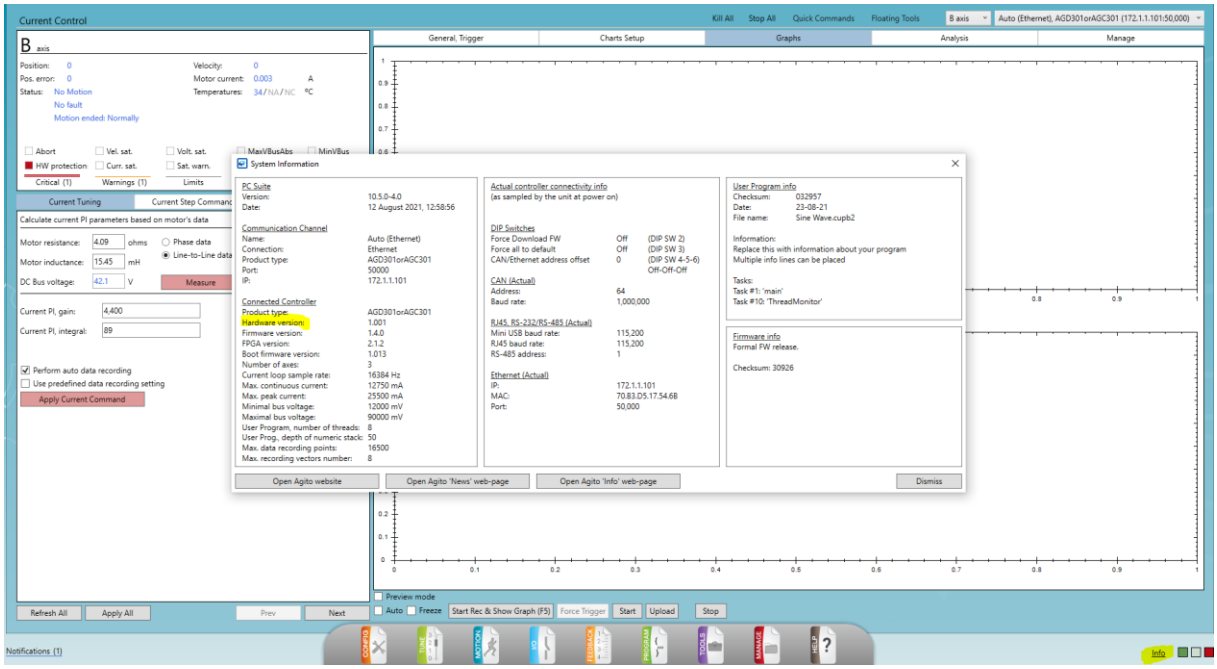
Standalone controls required updating both FW and FPGA, that is done by two steps.
Table 3: Defines FW and FPGA file per product and its HW revision

P/N	HW Rev	FW file name	FPGA file name
AGC300-ET-xx	Rev3	AGD200orAGC300_2D05_V 1.6.0.0.hex	AGD200_03layout_v1.17.1.dat
	Rev4	AGD200orAGC300_2D05_V 1.6.0.0.hex	AGD200_04layout_v1.17.1.dat
AGC301-ET-xx	all	AGD301orAGC301_2D05_V 1.6.0.0.hex	AGD301_v2.3.0.dat
AGD155-AF-2A06	all	AGD155_2A06_V1.6.0.0.hex	AGD155_2A06_v2.5.0.dat
AGD155-AF-2A10	all	AGD155_2A10_V1.6.0.0.hex	AGD155_2A10_v2.5.0.dat
AGD200-ET-xx	Rev3	AGD200orAGC300_2D05_V 1.6.0.0.hex	AGD200_03layout_v1.17.1.dat
AGD200-ET-xx	Rev4	AGD200orAGC300_2D05_V 1.6.0.0.hex	AGD200_04layout_v1.17.1.dat
AGD301-ET-2D05-xx	all	AGD301orAGC301_2D05_V 1.5.0.1-908 (ALPHA).hex	AGD301_v2.3.0.dat
AGD301-ET-2D09-xx	all	AGD301orAGC301_2D09_V 1.5.0.1-908 (ALPHA).hex	AGD301_v2.3.0.dat

Table 4: Standalone controls FW/FPGA files

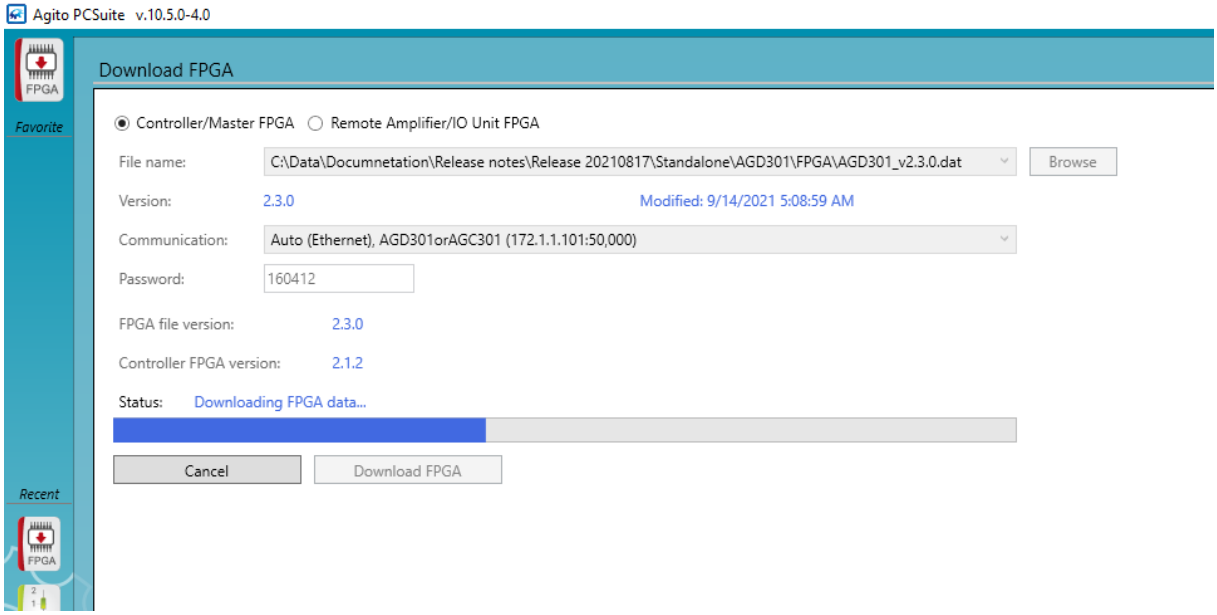
To update FPGA:

- First step is to identify the HW revision. It can be done in info screen or by checking product label.



- Press “Manage” button and select “FPGA:

- Select “Controller/Master FPGA” radio button
- Chose FGPA file name according to Table 4, the file shall be copied to local disk.
- Select “connection”, by default it will be Auto (Ethernet), AGDxxx (172.1.1.101:50,000)
- Set Password: 160412
- Press “Download FPGA” button

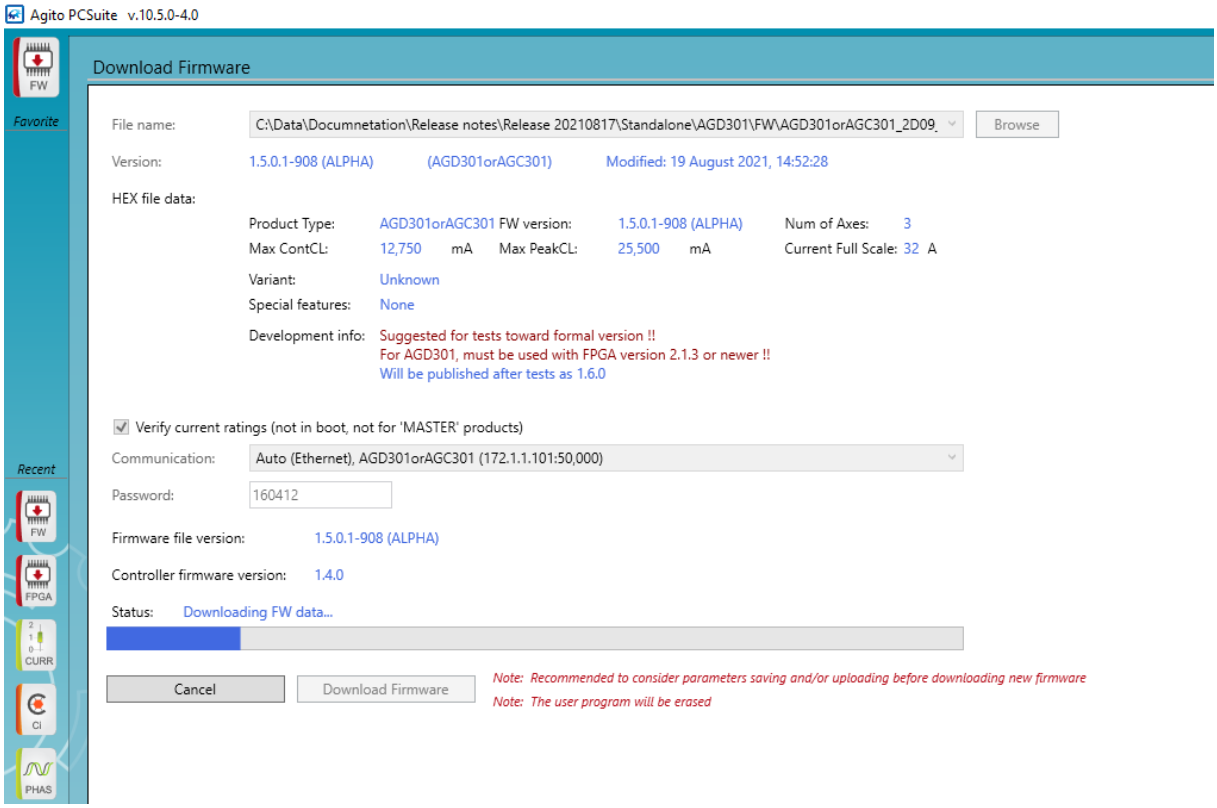


To update FW:

- Press “Manage” button and select “FW:

- Chose FW file name according to Table 4, the file shall be copied to local disk.
- Select “connection”, by default it will be Auto (Ethernet), AGM800 (172.1.1.101:50,000)
- Set Password: 160412

- Press Download FW button



The unit will be restarted automatically. You might want to download user programs and restore controller parameters.

For technical support and questions contact us by email: agito.info@akribis-sys.com