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HY-TTC 30 Family

Release Note

Document type:	Release Note
Document number:	D-TTC-X-DN-20-006
Document revision:	1.2
Release version:	1.30.1
Release date:	12-Feb-2021
Security:	Corporate Confidential
Status:	Released

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The product or Sample is only allowed to be used in the scope as described in section "System Overview". Please note that based on the current state of the art in science and technology, it is impossible to develop software that is bug-free in all applications.

Contents

1	Introduction	3
1.1	Version Overview	3
2	Installation Instructions	5
3	Update Instructions	6
3.1	Update Project	6
4	Revision Details	7
4.1	New Features	7
4.2	Fixed Issues	8
5	Known Issues	10
6	Appendix	11
6.1	Compatibility Matrix	11
	Acronyms	12
	References	14
	Legal Disclaimer	15

1 Introduction

This document lists all new features, new functions and bug fixes which are available with the software release for HY-TTC 30 family. Read this document carefully, it also contains information on compatibility and instructions on updating projects and devices.

The latest software release and documentation can be found on the service area on our website.

URL <https://www.ttcontrol.com/service-area/>

Username ttcontrol

Password +Flexibility

1.1 Version Overview

The following software versions are included in this release:

	HY-TTC 30H	HY-TTC 30SH	HY-TTC 32	HY-TTC 32S
I/O Driver	1.30.1	1.30.1	1.30.1	1.30.1

Table 1: Included software versions

The following document versions are included in this release:

Artefact ID	Title	Version
D-TTC-X-G-02-001	HY-TTC 30 Family Hardware User Manual	1.1.6 [1]
H-TTC-X-AC-02-001	HY-TTC 30 Family Summary of Test Reports	1.5 [2]
D-TTC-X-GU-20-001	HY-TTC 30 Family Quick Start Guide C Programming	1.1.1 [3]
D-ECU-AN-02-001	HY-TTC ECUs Application Note Lamp Loads	1.0.0 [4]
D-TTC-X-AN-20-001	HY-TTC 30 Family Application Note Auto Baud Rate Detection (ABRD)	1.0.0 [5]
D-TTC-X-AN-20-002	HY-TTC 30 Family Application Note PID Controller	1.0.0 [6]
D-TTC-X-G-20-001	HY-TTC 30 Family C API Manual	1.30.1 [7]
D-TTC-X-M-02-002	HY-TTC 30 Safety Manual for HY-TTC 30S	1.7.3 [8]
D-TTC-X-G-20-004	HY-TTC 30 Family Original Instructions for HY-TTC 30S	1.0.4 [9]
D-TTC-X-G-20-008	HY-TTC 30 Family Pinout Sheet	2.3.1 [10]
D-TTC-X-G-02-003	HY-TTC 30 Family SISTEMA Library	2.2.2 [11]
D-TTC-X-E-02-002	HY-TTC 30 Family EU Declaration of Conformity HY-TTC 30S	n.a. [12]
D-TTC-X-E-02-003	HY-TTC 30 Family EU Declaration of Conformity HY-TTC 30	n.a. [13]
n.a.	HY-TTC 30 Family E-Mark Approval	n.a. [14]
n.a.	HY-TTC 30 / 30X Safety Certificate	n.a.
n.a.	HY-TTC 30 EC Type-Examination Certificate	n.a.
n.a.	TTControl Software License Terms	n.a.

Table 2: Included document versions

2 Installation Instructions

Since no installer is provided together with this software release, this section is not applicable for the product. A general description of the directory structure is given in the Quick Start Guide [\[3\]](#).

3 Update Instructions

Please check the instructions in the TTC-Downloader Help, How-To Download an application. Please check that your local installation of the TTC-Downloader matches the version information as provided by section 5 of this document.

3.1 Update Project

For updating existing projects to this software release, the following steps need to be done:

1. Optionally create a backup copy of the project.
2. Replace the library files with the provided ones in `Get_Started\Template\lib`.
3. Replace the header files with the provided ones in `Get_Started\Template\inc`.
4. Replace the board support package files with the provided ones in `Get_Started\Template\bsp`.
5. Replace the make include file `settings.mk` with the provided one in `Get_Started\Template\build`.
6. Merge the changes from the Makefile.
7. Check section 4. Some minor code changes might be necessary.



TTControl strongly recommends to put your project under version control (e.g. SVN).

4 Revision Details

4.1 New Features

APDB updated to be unified with future products

TTC30-278/IO-Driver

The APDB (Application Data Block) has been slightly modified to conform to the future TTControl products. This requires one-time changes in newly built applications.

- The include has to be changed from

```
#include "APDB.h"
to
#include "Apdb.h"
#include "ApdbCfg.h"
```
- The definition of the APDB has to be changed from

```
APDB appl_db =
to
LOCATE_APDB appl_db =
```

- Some APDB members were renamed to CamelCase

Old name	New name
APDBVersion	ApdbVersion
CRCStartAddress	CrcStartAddress
LegacyApplicationCRC	LegacyApplicationCrc
ApplicationCRC	ApplicationCrc
CRCSeed	CrcSeed
CANDownloadID	CanDownloadId
LegacyHeaderCRC	LegacyHeaderCrc
CANBaudrate	CanBaudrate
CANChannel	CanChannel
TargetIPAddress	TargetIpAddress
DLMulticastIPAddress	DlMulticastIpAddress
ABRDTimeout	AbrdTimeout
ManufacturerID	ManufacturerId
ApplicationID	ApplicationId
HeaderCRC	HeaderCrc

4.2 Fixed Issues

Switching PWM outputs in the frequency close to the cycle time results in FET protection error TTC30-375/IO-Driver

When PWM outputs are toggled quickly between e. g. 50% and 0% duty cycle, it can happen that the current limit is already set for the new duty cycle, but the old current value was still measured. This led to an erroneous activation of the FET protection. The calculation of the current limit has been changed to be in synch with the actual duty cycle.

Workaround

Enabling the diagnostic margin in `IO_PWM_Init()` avoids this problem.

Error detection in case of fast switching on/off of outputs TTC30-123/IO-Driver

When changing the duty cycle on HSOUT pins without current measurement, it could happen that the output stage goes into Fatal FET Protection state. This is due a miscalculation of the actual current. The calculation has been updated to take the slow rise/fall of the measured current into account, preventing an erroneous shut-off.

Frequency spikes when reading a rectangle signal TTC30-276/IO-Driver

When reading a frequency value via `IO_PWD_ComplexGet` the read back value may have short deviations (spikes) up to 3%. The higher the measured frequency the higher the error can be. This is due to conflicting interrupts between the timers and ADC channels. The interrupt priorities have been changed to prevent the conflict.

CAN receive FIFO stalls TTC30-247/IO-Driver

In some cases with high baud rates the receive FIFO of the CAN controller gets filled faster than the CPU can process the messages. In the old implementation the FIFO sometimes stalled in such a case. The new implementation got improved in order to avoid FIFO stalling. Furthermore the return codes of `IO_CAN_ReadFIFO()` and `IO_CAN_FIFOStatus()` have been updated.

- `IO_E_OK`
FIFO contains elements, might be exactly full, but no messages lost
- `IO_E_CAN_OVERFLOW`
old meaning: FIFO overrun, messages can be lost, only returned if a message was overwritten at the same time as the CPU tried to process it
new meaning: FIFO overrun, messages can be lost, returned any time a message was overwritten somewhere in the FIFO
- `IO_E_CAN_FIFO_FULL`
removed

Duty cycle of output H1 will not set**TTC30-241/IO-Driver**

Deinitialization for VOUT pins H1 and K1 was not done correctly, causing the re-enabling to fail.

Not all possible configurations were allowed on PWD pins**TTC30-238/IO-Driver**

It is now possible to combine `IO_PIN_USAGE_PWD_COMP`, `IO_PIN_USAGE_ADC_ALT_PWD` and `IO_PIN_USAGE_DI_ALT_PWD` pins in the same group with the same pull up/down configuration.

DIN hysteresis reported wrong values in specific cases**TTC30-193/IO-Driver**

When defining overlapping hysteresis values, always the closest limit would be used for a state change. For example if the upper limit for "low" (ULL) is greater than the lower limit of "high" (LLH), the transition from "low" to "high" now occurs when the level is above ULL. Before it was occurring when the level was higher than LLH. Same applies for state transitions from "high" to "low".

Diagnostic pulses on PWM pins were active even though the diagnostic margin was disabled
TTC30-52/IO-Driver

When configuring a PWM output with the diagnostic margin disabled, the I/O Driver was still generating diagnostic pulses. In the updated version these pulses are only generated with the diagnostic margin enabled.

5 Known Issues

Not applicable.

6 Appendix

6.1 Compatibility Matrix

		Product-Version	
		V01.01	V01.03
I/O Driver	V1.2.46	●	*
	V1.6.0	●	*
	V1.8.3	●	*
	V1.10.0	●	*
	V1.10.4	●	*
	V1.10.6	●	*
	V1.16.0	●	*
	V1.18.2	●	●
	V1.20.0	●	●
	V1.24.0	●	●
	V1.28.0	●	●
	V1.30.1	●	●

Table 3: I/O Driver / Product-Version

● ... Compatible

* ... Compatible but external discharge resistor required according to [1]

		Product-Version	
		V01.01	V01.03
Product Variant	HY-TTC 30H	●	●
	HY-TTC 30SH	●	●
	HY-TTC 32	✗	●
	HY-TTC 32S	✗	●

Table 4: Product Variant / Product-Version

● ... Compatible

✗ ... Incompatible

		TTC-Downloader			
		< V4.12.xx	= V4.12.xx	= V4.14.xx	>= V4.18.xx
Bootloader	V3.0.0	✗	●	●	●
	V3.1.0	✗	●	●	●
	V3.2.0	✗	●	●	●
	V3.3.0	✗	●	●	●
	V3.5.0	✗	✗	●	●
	V3.6.0	✗	✗	✗	●

Table 5: Bootloader / TTC-Downloader Compatibility

● ... Compatible

✗ ... Incompatible

Acronyms

SVN Apache Subversion

TTC TTControl

References

- [1] TTControl GmbH. HY-TTC 30 Family Hardware User Manual. D-TTC-X-G-02-001.
- [2] TTControl GmbH. HY-TTC 30 Family Summary of Test Reports. H-TTC-X-AC-02-001.
- [3] TTControl GmbH. HY-TTC 30 Family Quick Start Guide C Programming. D-TTC-X-GU-20-001.
- [4] TTControl GmbH. HY-TTC ECUs Application Note Lamp Loads. D-ECU-AN-02-001.
- [5] TTControl GmbH. HY-TTC 30 Family Application Note Auto Baud Rate Detection (ABRD). D-TTC-X-AN-20-001.
- [6] TTControl GmbH. HY-TTC 30 Family Application Note PID Controller. D-TTC-X-AN-20-002.
- [7] TTControl GmbH. HY-TTC 30 Family C API Manual. D-TTC-X-G-20-001.
- [8] TTControl GmbH. HY-TTC 30 Safety Manual for HY-TTC 30S. D-TTC-X-M-02-002.
- [9] TTControl GmbH. HY-TTC 30 Family Original Instructions for HY-TTC 30S. D-TTC-X-G-20-004.
- [10] TTControl GmbH. HY-TTC 30 Family Pinout Sheet. D-TTC-X-G-20-008.
- [11] TTControl GmbH. HY-TTC 30 Family SISTEMA Library. D-TTC-X-G-02-003.
- [12] TTControl GmbH. HY-TTC 30 Family EU Declaration of Conformity HY-TTC 30S. D-TTC-X-E-02-006.
- [13] TTControl GmbH. HY-TTC 30 Family EU Declaration of Conformity HY-TTC 30. D-TTC-X-E-02-007.
- [14] Austrian Federal Ministry of Transport, Innovation and Technology. HY-TTC 30 Family E-Mark Approval. BMVIT-789.249/0001-IV/BAV/TG/2014.

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