Technical Note

MRa, BRo, 2013-05-13
C863T0003, valid for C-863.11, FW version 1.3.0.4

New Functionality for C-863.11 Mercury Controller

This Technical Note describes the new functionality provided by firmware version 1.3.0.4 for the C-863.11 Mercury controller.

Extended Factor for Counts per Physical Unit

The range of the parameters ***Numerator Of The Counts-Per-Physical-Unit Factor*** (0xE) and ***Denominator Of The Counts-Per-Physical-Unit Factor*** (0xF) is extended to 1,000,000,000.

Reference Point Definition

A new reference signal type can be used for reference moves started with the FRF command. For that purpose, the ***Reference Signal Type*** parameter (ID 0x70) provides the following new value:

- 2 = Index pulse: If a reference move to the reference point switch is started with FRF, the approach takes place via the negative limit switch.

The following new parameters are provided to configure reference moves:

Parameter	Description and possible values
Use Limit Switches Only For Reference Moves? 0x77	Should the limit switches only be used for reference moves? 0 = Use limit switches for stopping at the end of the travel range and for reference moves (default) 1 = Use limit switches only for reference moves This parameter is intended for use with rotary stages. This parameter is only evaluated when the parameter 0x32 has the value 0.
Distance From Limit To Start Of Ref. Search (Phys. Unit) 0x78	Distance between limit switch and the starting position for the motion to the index pulse
Distance For Reference Search (Phys. Unit) 0x79	Maximum distance for the motion to the index pulse

The parameters 0x78 and 0x79 are used for reference moves when the two following conditions are met:

- The reference move is started with FRF.
- The ***Reference Signal Type*** parameter has the value 2.

Sequence of the reference move in this case:

1. The axis moves to the negative limit switch.
2. The axis moves the distance given by the parameter 0x78 away from the limit switch.
3. The axis moves to the index pulse and thus travels the distance specified by the parameter 0x79 at the maximum.

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Data Recorder: New Trigger Option

With the DRT command, you can specify how the recording is to be triggered.

Syntax:

DRT <RecTableID> <TriggerSource> <Value>

For <TriggerSource>, the following new option is available:

3 = external trigger; <Value> gives the ID of the digital input line to be used for trigger input (see Section 14.4.2 “I/O” in the C-863.11 user manual for available lines).

Example:

For all data recorder tables, the recording is to be triggered via digital input line 1. You have to send:

DRT 0 3 1

The cycle time of the servo loop for the C-863.11 is 20 kHz. Hence the maximum frequency of the trigger signal should be 10 kHz. Use the RTR command to set the record table rate, i.e. the number of servo-loop cycles to be used in data recording operations.

Data Recorder: New Data Handling for Data Recorder Tables

The following new parameters are provided to configure the handling of the recorded data:

Parameter	Description and possible values
Recorded Points Per Trigger 0x16000001	Gives the number of points to be recorded per trigger: 0 = No limit for the number of points (default) *n* = *n* points; *n* is an integer value, smallest possible value is 1 When the data recorder tables are full, the behaviour depends on the value of the ***Data Recorder Buffer Mode*** parameter.
Clearing Of RecTable On Trigger 0x16000002	Determines how the data points are written in the data recorder table when recording is started by a trigger: 0 = Recorded points are appended to the already existing content of the data recorder tables (default) 1 = Data recorder tables are cleared by the trigger, i.e. recording always starts with the first point of the data recorder tables
Data Recorder Buffer Mode 0x16000003	Determines the behaviour when the data recorder tables are full: 0 = Recording ends (default) 1 = Recording continues with the first point of the data recorder tables, and the value of the ***Data Recorder Buffer Overflow*** parameter increases by one.

Parameter	Description and possible values
Data Recorder Buffer Overflow 0x16000004	Counter for the number of times recording starts again with point 1 when the ***Data Recorder Buffer Mode*** parameter has the value 1. A query with DRR? resets the parameter value to zero. The parameter is read-only.

The following new command is provided for data recording:

DRL? (Get Number of Recorded Points)

Description: Reads the number of points comprised by the last recording.

Format: DRL? [{<RecTableID>}]

Arguments: <RecTableID> is one data recorder table of the controller

Response: {<RecTableID>"="<uint> LF}

where

<uint> gives the number of points recorded with the last recording

Notes: The number of points is reset to zero for a data recorder table when changing its configuration with DRC.

If the ***Data Recorder Buffer Mode*** parameter (ID 0x16000003) has the value 1, recording does not end when the data recorder tables are full but continues with the first point of the data recorder table. The content of the data recorder tables may be overwritten once or several times in this case. It is therefore recommended to read out the data with DRR? while recording is still in progress. Using the value of the ***Data Recorder Buffer Overflow*** parameter (ID 0x16000004), you can calculate the number of points which were recorded since the last DRR? query:

Number of recorded points = DRL? response + max. number of points per table * ***Data Recorder Buffer Overflow*** value