T-1654 e	Commissioning with Base Door Module BDM	★★★★★ TORMAX AUTOMATIC
Area of application	**TORMAX 1102, 1201** Swing Door Drive from V03.xx	TORMAX | CH-8180 Bülach www.tormax.com info@tormax.com
Release	6 February 2017	
Use	Planning, maintenance	

Precondition

– The drive has been installed and is ready for connection.
– The various linkage parts have been installed.
– The cone (drive shaft) has not yet been tightened.

Programming the Control System with the On-board Configuration Tool

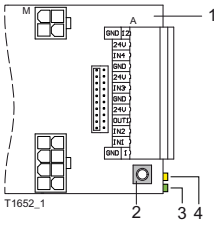
The on-board configuration tool is typically used for commissioning systems including double doors according to standard programming. It enables the linkage to be adjusted and the basic configuration of the system to be established; this can also be done with EDM, PDM and MDM modules. A rather wider range of functions can be easily achieved with the user interface by means of code programming or by means of Skipper. Either the EDM or the PIM module is needed for this. Please see the Components overview in T-1660 for more details.

If door is installed **without** a Power Door Module (PDM) the force at the main closing edge is limited to 67 N (Low Energy). The force in opening and closing direction can be reduced only. See programming table, TORMAX Extranet.

If door is installed **with** a Power Door Module (PDM) default force is 120 N (High Energy) at the main closing edge. Assembly personnel is allowed to adjust the closing force up to max. 175 N (UL 325, chapter 29.4.3). See programming table, TORMAX Extranet.

An external entrapment protection device shall comply with the applicable requirements in UL325, sections 34 – 37.

On-board Configuration Tool

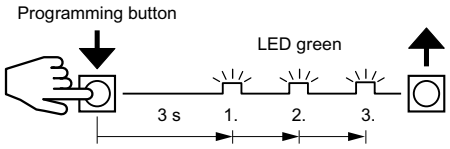


1 Base door module BDM
2 Programming button
3 LED green: status display (control system ready for operation) or configuration display
4 LED yellow: error display or configuration display

Programming Procedure – General

- Keep the programming button **depressed**. After three seconds the **green** LED starts to flash at one second intervals. The number of flashes corresponds to the programming code as in the programming table. If pressing the programming button is confirmed directly with a beep, the programming button has to be enabled with the user interface USIN-7, code 900 or with Skipper.
- **Release** the programming button after the required number of flashes.
- Entering parametes (code 1and 4 only): **Press** the programming button after the required number of flashes (**yellow** LED).

Example: Code 3 “Detecting safety sensors” (see below for codes)



→ This ends the programming step.

Programming Codes

In order to ensure the safety of the system, please follow the details of the programming steps in the following pages.

Commissioning the System

- The yellow LED flashes briefly every 5 seconds to show that the system is ready for commissioning.

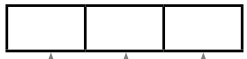
If the previous programming is unknown, carry out a factory reset first (code 5). The drive type 1102, 1201 is programmed at the factory. The drive typeremains after a factory reset.
If the BDM module is replaced, the drive type must be first programmed with the user interface USIN-7.
Code 011 for drive type 1102; code 012 for drive type 1201 (= standard value).
The system parameters must be defined and saved for each system!

Note on double-leaved doors

- Connect double-leaved systems by means of the CAN-bus and short-out IN1 and IN2 to GND on the secondary drive. After switching on the power supply (first the primary drive and then the secondary drive or both at the same time), both drives are automatically configured as the primary and then the secondary drive. A two-note acoustic signal is heard from the secondary drive as confirmation. The standard configuration is suitable for double-leaved doors with an overlap. For options, see programming via user interface USIN-7, without overlap: Code 830, with mechanical door coordinator MDC Code 832.

Determination of System Parameters

Enter matching values on label next to the control system

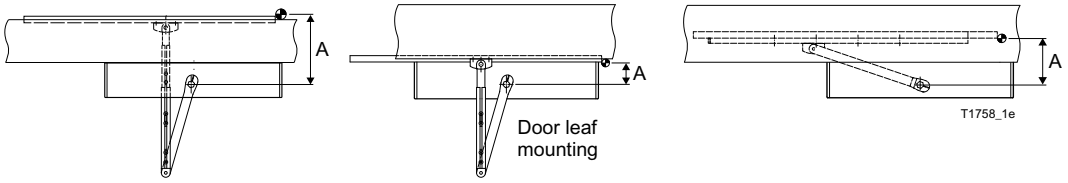


Door width (value 1)

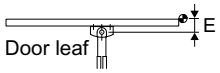
70	80	90	100	110	120	130*)	140*)	Door width [cm]
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Value 1**

*) TORMAX 1201 only

Axis distance A (value 2)

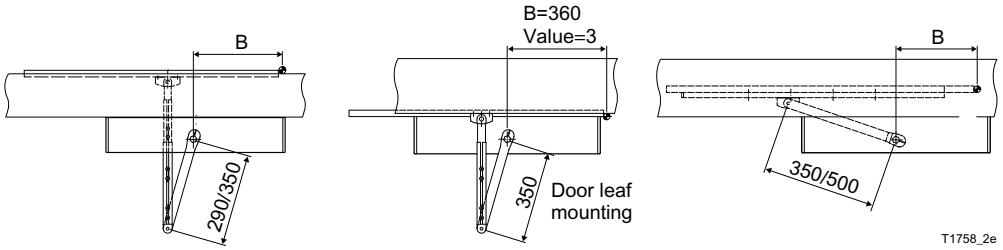


31…66*)	67…112	113…162	163…214	215…264	265…311	Axis distance A [mm] standard linkage 290
–29…–13*)	–12…11*)	12…47*)	48…109	110…185	186…251	Axis distance A [mm] standard linkage 350
71…89	90…109	110…134	135…159	160…189	190…221	Axis distance A [mm] sliding lever
1	**2**	**3**	**4**	**5**	**6**	**Value 2**



*) If E > 0, check the force on the door and reduce if necessary with user interface USIN-7.

Lever length with axis distance B (value 3)



Standard linkage			**Sliding lever**			
290	350	350	350	500	500	Lever length [mm]
310	310 … 334	335 … 360	230	230 … 309	310 … 360	Axis distance B [mm]
1	**2**	**3**	**4**	**5**	**6**	**Value 3**

Note on the display and input of the three values

The 3 values can be confirmed in sequence by pressing the button after commencement of the commissioning (Code 1).

So that there is enough time to count the correct number of flashes from the LED and to stop the flashing by pressing the button when the right number of flashes has been counted, the sequence is continually repeated for each parameter if nothing is entered. Each sequence is started by a signal tone.

Example for values | **2** | **1** | **4** |

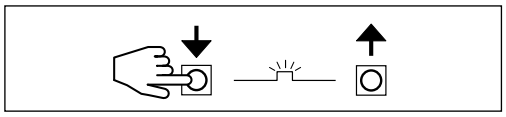
1 × signal tone – yellow LED flashes ▶ press button briefly after **2** flashes

2 × signal tones – yellow LED flashes ▶ press button briefly after **1** flash

3 × signal tones – yellow LED flashes ▶ press button briefly after **4** flashes

Start Commissioning

- Select operating mode AUTOMAT. Do not activate the key switch.
- Switch on the power when the drive shaft is loose.

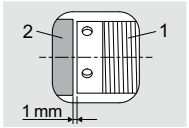


- Press the programming button and keep it depressed until the green LED lights up for the first time → **Code 1**
  The green LED flashes until the procedure is complete.

Procedure using Code 1	**Conditions**	**Result**
• Confirm the three values of your system ☐☐☐ (one after the other) by pressing the button after the corresponding number of flashes.	This input is necessary to calculate the force at the door edge.	The forces at the door edge are defined and correspond to the forces in programming table 30x and 31x
The output shaft rotates about 20 degrees. The spring is now pre-tensioned. Indicated by double tone. • Connect the linkage and **bolt the drive shaft firmly at 32 Nm** when the door is closed. • Press the programming button briefly → The door closes, keeps pressing resp. → Double tone	The drive shaft is still loose.	The spring is pre-tensioned and the zero position defined.
The weight detection run starts automatically. The door opens slowly. The weight is detected during the movement by one short acceleration. • Stop the door in the required open position by hand or allow it to travel up to the stop. → Double tone → The door closes slowly.	**Do not touch the door during recording.** If the door is strongly buffeted by wind during the brief acceleration period we recommend that you restart the commissioning process (code 6).	The weight of the door has been defined. The open position of the door has been defined.
The connection type of the safety sensors is detected after a waiting period of 5 seconds (rising acoustic signal). The door opens and closes again. The automatic masking-out of the wall during opening is indicated with a signal tone. After the open position has been reached, the number of testable safety sensors detected is indicted by the green LED flashing from 0–2 times.	Do not enter the detection area of the moving safety sensors.	If the testable safety sensor “Open” is detected successfully the door opens with high energy. If the testable safety sensor “Close” is detected successfully the door closes with high energy. The “Open” safety sensor is automatically masked out when the door encounters a wall. The contact type to in3/in4 PDM (NC, NC with test or NO) and in4 BDM (NC, NO) is defined.

Adjusting the stop

- Select operating mode OPEN
- Turn internal stop (1) up to 1 mm to the toothed rack (2).

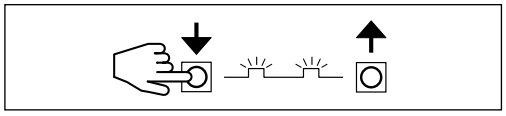


Procedure with double doors

The commissioning is started automatically on the secondary drive. The primary drive opens automatically. The commissioning procedure is identical as with the primary drive. The primary drive closes after completion as well.

Teach-in (optional)

The teach-in can be used to amend the predetermined motional sequence with regard to the opening cycle, opening angle, hold open time, closing cycle and, if required, the latching action.



- Press the programming button and keep it depressed until the green LED lights up for the second time → **Code 2**

Procedure using Code 2	Conditions	Result
• Open the door at the required speed. • Hold the door open in the required open position with the required hold-open time. • Close the door at the required speed. Concerning UL325 Chapter 29.4.3 b) assembly personnel must teach in the door movement in a manner that the final 10 degrees of the closing movement are driven within a time <1.5 s.	The door must be closed at the beginning.	The motional sequence “Opening“, the opening width, the hold-open time and the motional sequence “Closing” are detected and saved.
The sequence the door system has “learned” is demonstrated after a 5 second pause (rising signal tone).		

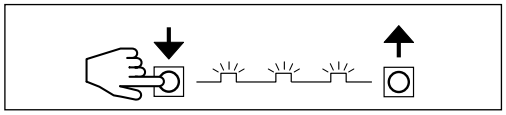
Double door: For an undisturbed teach-in on the secondary drive the primary drive opens automatically.
The teach-in on the secondary drive must be started separately with code 2.

If the door weight is heavy, open and close the door gently and brake it early.

If low-energy is used the requirements according to the application T-1808 must be observed! Opening and closing speeds are not automatically considered. The kinetic energy is automatically limited to 1.69 J.

Detecting Safety Sensors (optional)

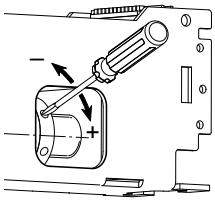
If the safety sensors (connected to in3/in4 PDM and in4 BDM) were not correctly detected during commissioning or are newly connected, they can be detected later.

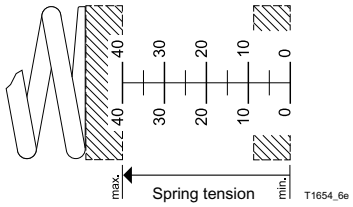


- Press the programming button and keep it depressed until the green LED lights up for the third time → **Code 3**

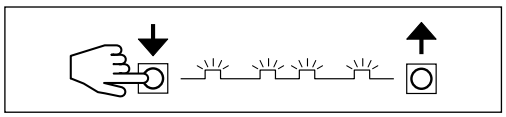
Procedure using Code 3	Conditions	Result
After a waiting time of 5 seconds (rising motor signal tone) the connection type of the safety sensors is detected. The door opens and closes again. When the open position is reached the number of testable safety sensors detected is indicated by the green LED flashing from 0 to twice.	Sensors must be correctly connected. Do not enter the detection area of the moving safety sensors on the door.	If the testable safety sensor “Open” is detected successfully the door opens with high energy. If the testable safety sensor “Close” is detected successfully the door closes with high energy. The “Open” safety sensor is automatically masked out when the door encounters a wall. The contact type to in3/in4 PDM (NC, NC with test or NO) and in4 BDM (NC, NO) is defined.

Tensioning the Spring (only for TORMAX 1201)





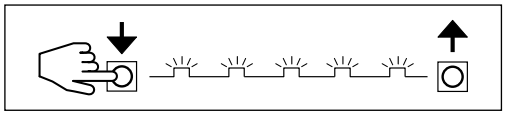
- Open the door manually in currentless state.
  → the door must close completely.
  Windloads/closing sizes have to be considered.
- If the spring tension has been adjusted, enter the corresponding value. The forces on the door edge are correctly restricted in this way.
  Standard value = 0 mm



- Press the programming button and keep it pressed until the 4th time the green LED flashes → **Code 4**
- Press the button again briefly after the required number of flashes (yellow LED).

1	2	3	4	5	6	7	8	9	Number of flashes
0	5	10	15	20	25	30	35	40	Spring tension in mm

Factory Reset (optional)

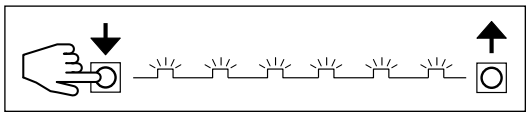


- Press the programming button and keep it depressed until the 5th time the green LED flashes → **Code 5**

Procedure using Code 5	Conditions	Result
The current system parameters are deleted and the parameters set to standard values. The green LED flashes twice in confirmation.		The current system parameters are deleted. The automatic configuration is needed again.

Repeat Commissioning (without system values)

This function only starts if the commissioning (Code 1) has previously been completed once. This function corresponds to Code 1 but without the input of the three system-specific values.



- Press the programming button and keep it depressed until the 6th time the green LED flashes → **Code 6**

Procedure using Code 6	Conditions	Result
The output shaft rotates through approximately 20° degrees. The spring is now pre-tensioned. Indicated by a double tone. • Join the linkage and tighten the **drive shaft firmly at 32 Nm** when the door is closed. • Press the programming button briefly → The door closes, keeps pressing resp.	The drive shaft is still loose.	The spring is pre-tensioned and the zero position defined.
The weight detection run starts automatically. The door opens slowly. The weight is detected during the movement by short accelerations. The door closes slowly.	**Do not touch the door during recording.** Avoid wind gust!	The weight of the door has been defined.
The function of the safety sensors is automatically tested. The trial opening occurs after a pause of 5 seconds (rising signal tone). The trigger point of the moving “Open” safety sensor is automatically detected.	Do not enter the detection area of the safety sensors on the door.	If the testable safety sensor “Open” is detected successfully the door opens with high energy. If the testable safety sensor “Close” is detected successfully the door closes with high energy. The “Open” safety sensor is automatically masked out when the door encounters a wall.

Settings for Low-Energy

For correct settings of the system the application T-1808 must be respected!

LED Displays

Yellow LED flashes every 5 s	The commissioning has not yet been carried out.
Yellow LED off	☺ OK
Yellow LED on	☹ Error (E). Error display see user interface or with Skipper. Error list – see TORMAX Extranet product support DB-3.
Green LED on	☺ Power supply and module OK
Green LED off	☹ No power supply or power supply is overloaded.
Green LED flashes	A programming step was started. The procedure is in progress (press the programming button to interrupt and enter again).
Green and yellow LED flash alternately	Serious system error → Switch the mains power off and on again and then press the programming button and hold it down for 5 seconds. This completes a factory reset.
Green LED flashes after the open position is reached	0 × = no testable safety sensor available. Door moves with Low-Energy. 1 × = 1 testable safety sensor available. Door moves in one direction with Low-Energy. 2 × = 2 testable safety sensors available. Door moves with Full energy.

LED display on EDM, MDM, PDM upgrade modules

Green LED on	☺ Power supply and module OK
Green LED off	☹ No power supply or module is defective

Testing

Test the door as specified in T-1280 before putting the door into service and handing it over to the operator.

According to UL 325 the power setting of 175 N must not be exceeded. Settings P319, P329, P309, are not permitted.

In order to prevent inappropriate handling with the on-board configuration tool the programming button can be blocked with code 901

Details on the Content of the Automatic Detection

Modules (MDM, EDM, PDM)	After switching on, the functioning module is automatically recognised and saved via the internal CAN-bus. Code 050 → EDM, 051 → PDM, 052 → MDM can be used to show whether modules were detected.
User interface USIN-7-A	The functioning module is recognised via the LIN-bus so long as it is switched on.
Reference travel distance/door weight	The door moves slowly in the opening direction up to the stop. The stop can be either the internal or external stop or, preferably, the door can be stopped by hand at the required position. The travel distance is saved. When in operation, the door moves to this point less a tolerance of approximately 1 degree. It should be noted that after a reset the door must find this position once again and therefore can move as far as the open stop during the search run. If necessary, the maximum opening can be limited by the internal stop. When the door is opening the door weight can be measured and calculated by a step response during opening.
Safety sensors “Opening” and “Closing”	Contact types NO or NC with or without monitoring are detected after a rising tone. The safety sensor must not be activated if automatic detection is in operation.
Masking out safety sensor “Opening”	The suppression run occurs the first time the door is opened after commissioning (rising tone). If the safety sensor is activated during opening, e.g. by the wall, the angle is saved. Starting from the next time the door is opened, any instruction from the safety sensor “Opening” is obeyed up to this angle (less a tolerance) but is not observed in any further movement.
Current reduction in hold-open position	The minimum amount of current needed to hold open the door is defined after commissioning or after the teach-in. The first measurement is made when the door remains open for the first time for at least 10 seconds. In this process the current is reduced step by step until the door begins to close. It opens again after about 2 degrees and the necessary amount of current is recorded. If there are any variations afterwards, the measurement of the current is automatically repeated and corrected very slowly. We recommend avoiding wind loads during the first measurement.

Maintenance

Skipper and user interface USIN-7 are needed for maintenance.

Firmware update to BDM, PDM, EDM and MDM and double-leaved door systems

1. Copy the FW for TORMAX 1201/1102 BDM and PDM, EDM, MDM from the Extranet onto a lap-top.
2. With Skipper, menu extras / FW update
3. Select the target: TORMAX
   Swing Door Drive with MCU42
4. Select the module: e.g. BDM
5. Select the appropriate FW file and start the download.
   The previous settings to the drive remain in place.
   The system is immediately ready for use again.
6. Carry out the update on the secondary drive.
   Double-leaved doors must be operated with the same FW version to ensure that they operate without problems.

BDM exchange

1. Install the latest firmware version with Skipper.
2. Enter the drive type with USIN-7
   Code 012 TORMAX 1201 = standard value
   Code 011 TORMAX 1102
3. Commission the door.

Replacement / addition PDM, EDM, MDM

1. Switch off the power supply and replace the module. Switch the power supply on again.
2. The module is automatically recognised → green LED lights up.
3. Check the firmware (see rear side of module or with Skipper) and install the latest version of the module firmware with Skipper if necessary.
4. Check the function of the components which are connected.

Removing PDM, EDM, MDM

Switch off the power supply and replace the module.

Switch on the power supply. → E2x appears.

Enter code 024 → E2x goes out.

Or: Use the on-board programming button for a code 5 factory reset and then carry out a code 1 commissioning.

Amending the instruction / system parameters

Drive position, linkage, door weight, spring tension

1. Redefine and enter the system parameters code 06x code 07x code 08x to suit the system.
   Or: Use the on-board programming button, code 1
2. Carry out code 021 commissioning (contained in programming with the on-board programming button, code 1)
3. Adjust spring tension code 09x
   Or: Use the on-board programming button, code 4

These settings are essential for the calculation of the forces and speeds for Low-Energy and for the calculation of the forces on the door edge.

Factory reset

The following are deleted:

– All parameters which were previously set (except drive type)
– System values which were automatically recorded (door angle, door mass, hold-open current)

The following are not deleted:

– Cycle and hour meters
– Drive type 1102 / 1201

Blocking the programming button

In order to prevent inappropriate handling with the on-board configuration tool the programming button can be blocked with code 901