

**MYOSTAT MOTION**  

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**CONTROL INC.**

# EB V200b Update

Version: 1.0.0

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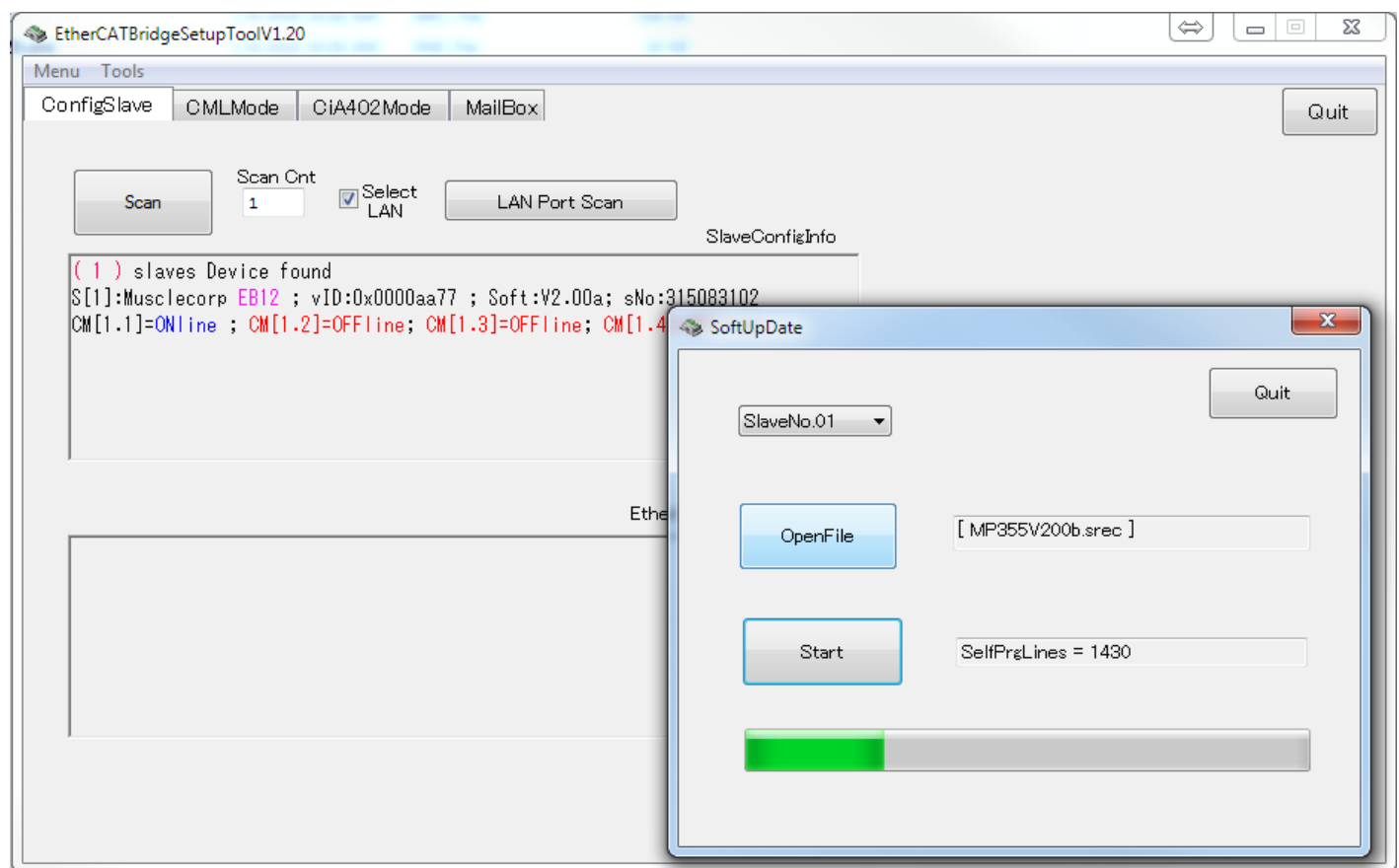
## 2 Introduction

This documentation refers to updates made up to and including version V200b on the Cool Muscle EtherCAT Bridge.

The latest version of the setup tool, bridge firmware and xml file can be found at <http://www.myostat.ca/support>.

### 2.1 Running the Update

1. Setup the bridge hardware and connect it to a PC running the setup tool.
2. Click the Scan button to find the bridge.
  - a. If there are multiple Ethernet ports use the LAN Port Scan to select the correct Ethernet Port
3. When the slave device is found you can go to Tools → SoftwareUpdate
4. In the software update screen select the firmware file by clicking OpenFile.
  - a. The firmware file MUST be in the same folder as the setup tool executable.
5. Once the update is complete close the setup tool and cycle power on the bridge.
  - a. Cycling power will load the new firmware from the flashrom. This is required to execute the new firmware.
6. Powering the bridge and reopening the tool should show a bridge with the loaded version.



**Figure 1: Setup tool showing V200b loading.**

### 3 PDOs

All mode objects are available on the PDOs even those that are not in use by the selected mode. Data in those objects shall be ignored.

#### 3.1 RxPDO

Object	Name	Length (bytes)	Effective Mode	Unit	Remarks
0x6040	Controlword	2 (UINT16)	All modes	-	
0x607A	Target Position	4 (INT32)	CSP,PP, CMLPDO	pulses	<ul style="list-style-type: none"> <li>Motor resolution in 50,000 pulses per revolution</li> </ul>
0x60FF	Target Velocity	4 (INT32)	CSV, PV, CMLPDO	pulses/ millisecond	
0x6071	Target Torque	2 (INT16)	CST, CMLPDO	-	<ul style="list-style-type: none"> <li>Not currently functioning in CSV mode</li> <li>Used as Target Acceleration in CMLPDO mode</li> </ul>
0x6081	Profile Velocity	4 (INT32)	PP	pulses/ second	

#### 3.2 TxPDO

Object	Name	Length (bytes)	Effective Mode	Unit	Remarks
0x6041	Statusword	2 (UINT16)	All modes	-	
0x6064	Position actual value	4 (INT32)	CSP, CSV, CST, PP, PV, CMLPDO	pulses	
0x606C	Velocity actual value	4 (INT32)	CSP, CSV, CST, PP, PV, CMLPDO	pulses/ millisecond	
0x6077	Torque actual value	2 (INT16)	CSP, CSV, CST, PP, PV, CMLPDO	% peak torque	



0x67F4	Cool Muscle Response	2 (INT16)	CSP, CSV, CST, PP, PV, CMLPDO	<ul style="list-style-type: none"><li>• 0.1V</li><li>• °C</li></ul>	<ul style="list-style-type: none"><li>• DC Bus voltage and Temperature</li></ul>
0x67F5	Cool Muscle Status	2 (INT16)	CSP, CSV, CST, PP, PV, CMLPDO	-	<ul style="list-style-type: none"><li>• Bit0-Bit7: Motor status (Ux value)</li><li>• Bit8-Bit15: Digital Inputs</li></ul>

## 4 Modes of Operation

The following modes of operation are implemented.

Modes of Operation <sup>(1)(2)</sup>	0x6060 value	Type
PV (Profile velocity mode)	3	CiA402 Standard
HM (Homing mode)	6	CiA402 Standard
CSP (Cyclic synchronous position mode)	8	CiA402 Standard
CSV (Cyclic synchronous velocity mode)	9	CiA402 Standard
CMLPDO (CML PDO mode)	100	Manufacturer Specific

(1) V200b will show CST and PP available but they are not fully developed and will not function

(2) V200b will show some addition manufacturer specific modes available. These are legacy modes and CMLPDO supercedes them.

The mode of operation can be dynamically changed using object 0x6060. The master should only switch to the new mode of operation when 0x6061 reflects the change.

### 4.1 Profile Velocity Mode (PV)

Profile velocity uses the following objects in addition to the Controlword, Statusword and all objects in the TxPDO

Object	Description	R/W	PDO Access
0x60FF	Target velocity	R/W	Yes
0x6083	Profile acceleration	R/W	No
0x6084	Profile deceleration	R/W	No

### 4.2 Homing Mode (HM)

This mode has not changed in the V200 update. Information can be found in the EB User's Guide found at <http://www.myostat.ca/ethercatbridgeCS>

### 4.3 Cyclic Synchronous Position Mode (CSP)

This mode has not changed in the V200 update. Information can be found in the EB User's Guide found at <http://www.myostat.ca/ethercatbridgeCS>

## 4.4 Cyclic Synchronous Velocity Mode (CSV)

Cyclic synchronous velocity uses the following objects in addition to the Controlword, Statusword and all objects in the TxPDO

Object	Description	R/W	PDO Access
0x60FF	Target velocity	R/W	Yes

CSV mode requires 1ms PDO updates to the target velocity.

## 4.5 CML PDO Mode (CMLPDO)

CML PDO mode allows the user to run the motor using its native Cool Muscle Language. The Controlword is used to transmit specific CML commands. Set the Controlword to the specific value to execute the CML command

CML Description	CML Command	Controlword Value	PDO Object Passing Value
Enable motor	(	0xF100	-
Disable motor	)	0xF200	-
Start dynamic move	^#	0xF300	P = 0x607A (TargetPosition) S = 0x60FF (TargetVelocity) A = 0x6071 (TargetTorque)
Stop command	]]	0xF400	-
Start program bank	[#	0xF500	# = 0x607A (TargetPosition)
Start logic bank	[L#	0xF600	# = 0x607A (TargetPosition)
Stop logic bank	]L	0xF700	
Start homing routine		0xF800	
Go to 0 position	1	0xF900	
Set current position to 0	2	0xFA00	

Additional information on using CML can be found at <http://docs.myostat.ca/>

