



p/n 88-017137-01 B

# 6K Series Programmer's Guide

Effective: March 3, 2003

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# IMPORTANT

## User Information



### WARNING



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# Change Summary

## Revision B Changes

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March 3, 2003

This document, 88-020680-01B, supercedes 88-020680-1A. Changes associated with 6K Series Programmer's Guide revisions, and document clarifications and corrections are as follows:

<b>Topic</b>	<b>Description</b>
Memory Allocation	Correction: Updated the memory allocation table. See page 11.
COMEXS	Added a table to help illustrate stop conditions. See page 16.
Variables	Clarifications: Can store message strings of 50 characters or less. Also, enhancements in the OS for string variables as of revision 5.1.0. See page 18. Better explanation for assigning and using binary variables. See page 22.
Error Handling	Added description of error bit 22. See pages 30 and 31.
System Performance	Clarification: Added explanation of "SYSTEM UPDATE OVERRUN, USE SYSPER4" error message. See page 34.
Memory Allocation	Changed cautionary message about issuing MEMORY command. See page 45.
Drive Type Selection	Added DSTALL to the list of Servo Only Commands. See page 46.
Drive Stall Detection	Added description of DSTALL command. See page 47.
Step Pulse	Correction: Maximum pulse width misstated as 16µs. Corrected to 8µs. See page 47.
Velocity Scaling	Correction: Added PVF command to commands that are multiplied by the SCLD command value. See page 50.
Distance Scaling	Correction: Added PVF command to commands that are multiplied by the SCLD command value. See page 51.

Topic	Description
End-of-Travel Limits	Correction: Added <code>ERROR</code> command to the list of related commands. See page 57.
Homing	Correction: Misstated that <code>HOMLVL</code> defines the active level of the home limit input. Corrected to <code>LIMLVL</code> . See page 59.
Homing Using Channel Z	Correction: Home profile attributes for Figure O misstated that Backup to Home is disabled ( <code>HOMBAC0</code> ). Corrected to enabled ( <code>HOMBAC1</code> ). See page 63.
Stall Detection & Kill-on-Stall	Correction: Added note that the encoder count reference must be enabled ( <code>ENCCNT1</code> ). See page 64.
Encoder Setup Example	Correction: Added <code>ENCCNT1111</code> to code example. See page 65.
Encoder Failure Detection	Enhancement: Added note to use <code>EFAIL</code> command only with differential encoders. See page 66.
Programmable Inputs and Outputs	Correction: Reference to analog outputs. Added PLC scan mode to table of programmed events. Clarified the results of “Kill on I/O Disconnect” mode with <code>KIOEN0</code> . See page 75.
Expansion I/O Bricks	Correction: Added <code>ANIRNG</code> and <code>TIO</code> commands to table. See page 78.
Input Status	Correction: The description for the status assignment/comparison operator for trigger inputs and digital inputs on expansion I/O has changed. See page 80.
Stop Input	Enhancement: Clarified how <code>COMEXS2</code> functions on receiving a stop input. See page 83.
Output Active Level	Enhancement: Added a table describing onboard output settings, states, factory defaults, external power supplies, and statuses. Expanded discussion about outputs on expansion I/O bricks. See page 91.
PLC Scan Mode	Correction: Clarified discussion about the PLC Scan Mode and scan time. See page 104.
To implement a PLC program	Clarification: Added <code>HALT</code> , <code>BREAK</code> , <code>TIMST</code> , and <code>TIMSTP</code> commands to list of allowed commands. See page 104.
Technical Notes about PLC Programs	Enhancement: Controller status bit 3 is set when a PLC program is executed during scan mode. See page 105.
Programming Example	Clarification: Corrected when the “Pause Scan” begins in the graphic. See page 106.

Topic	Description
Linear Interpolation	Correction: Removed references to <code>PSCLA</code> and <code>PSCLV</code> . See page <a href="#">123</a> . Also removed first two lines of code from code sample. See <a href="#">123</a> .
Path Definition	Correction: Correct total memory 300,000; default allocation (program,compiled) <code>MEMORY150000,150000</code> ; maximum allocation for compiled profiles <code>MEMORY1000,299000</code> . See page <a href="#">124</a> .
Path Final Velocity	Enhancement: Added discussion about line or arc segment termination with a final segment velocity (PVF). See page <a href="#">126</a> .
Conditional Path Execution	Enhancement: Added discussion about end-points for lines or arcs. See page <a href="#">127</a> .
Compiled Motion Profiling	Correction: Correct total memory 300,000; default allocation (program,compiled) <code>MEMORY150000,150000</code> ; maximum allocation for compiled profiles <code>MEMORY1000,299000</code> . See page <a href="#">136</a> .
Status Commands	Correction: Added the <code>TASF</code> , <code>TAS</code> , and <code>AS</code> commands. See page <a href="#">137</a> .
Rules for Using Velocity in Preset Compiled Motion	Enhancement: Replaces the section titled <code>Lst Motion Segment Must End At Zero Velocity</code> . See page <a href="#">138</a> .
Dwells and Direction Changes	Correction: Removed from sample code use of incremental position mode <code>MA0</code> . See page <a href="#">141</a> .
On-the-Fly Motion	Correction: Removed from sample code the disable scaling <code>SCALE0</code> . See page <a href="#">151</a> .
OTF Error Conditions	Enhancement: Clarified discussion about On-the-Fly error conditions. See page <a href="#">152</a> .
How to Set up a Registration Move	Clarification: Cannot configure the master trigger input. Removed See page <a href="#">155</a> .
Registration-Sample Application 2	Clarification: Removed from the sample code the reference to deceleration ( <code>AD.5</code> ). See page <a href="#">158</a> .
GOWHEN Syntax	Correction: Added <code>LIM</code> to list of right operands in the Relation Expression Syntax. See page <a href="#">160</a> .
Following Status	Clarification: Bit number 26 identifies if the the Following move profile is being limited by the <code>FMAXS</code> or <code>FMAXV</code> commands. See page <a href="#">167</a> .
Ratio Following Setup Parameters	Clarification: Master source axis number—If the master source is “8” ( <code>VARI</code> ), this represents the integer variable ( <code>VARI</code> ) number. Master source selection—Added source 8 <code>VARI</code> variable to the list. See page <a href="#">168</a> .

Topic	Description
Following an Integer Variable	Enhancement: Added discussion of an axis using to follow an integer variable. See page <a href="#">172</a> .
Repeatability of the Trigger Inputs and Sensors	Correction: Repeatability is dependant on trigger input position capture and your sensor accuracy. See page <a href="#">194</a> .
Multi-Tasking Application Example	Correction: Corrections to solution. See page <a href="#">219</a> .
Status Commands	Enhancements: <code>TASF</code> —Added bit 29 <code>GOWHEN</code> error, and bit 31 Executing Profile. <code>TASXF</code> —Added bit 7 Drive Stall Active. <code>TFSF</code> — Added bit 26 Following profile is limited ( <code>FMAXA/FMAXV</code> ) <code>TERF</code> — Added bit 5 Stop or Kill Issued, 19 Option Card Fault, and 22 Etherer Failure. Other status commands— <code>TSCF</code> and <code>TNT</code> . See page <a href="#">226</a> .
List of all Status Commands	Enhancement: Added <code>TANO</code> , <code>TNT</code> , and <code>TSC</code> to list of commands. See page <a href="#">230</a> .
Error Messages	Enhancement: Added error messages for <code>MASTER</code> , <code>SLAVE DISTANCE MISMATCH</code> ; <code>OUTPUT BIT USED AS OUTFNC</code> ; and <code>SYSTEM UPDATE OVERRUN</code> , USE <code>SYSPER4</code> . See page <a href="#">232</a> .
Breakpoints	Enhancement: Added discussion on use of program breakpoints ( <code>BP</code> ). See page <a href="#">238</a> .



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