ABB INDUSTRIAL DRIVES

ACS880 override control program (option +N5450)

Supplement

List of related manuals

Drive firmware manuals and guides	Code
ACS880 primary control program firmware manual	*3AUA0000085967*
ACS880 drives with primary control program, quick start-up guide	*3AUA0000098062*
Adaptive programming application guide	*3AXD50000028574*
Drive application programming manual (IEC 61131-3)	*3AUA0000127808*
ACS880 diode supply control program firmware manual	*3AUA0000103295*
ACS880 IGBT supply control program firmware manual	*3AUA0000131562*
ACS880 distributed I/O bus supplement	*3AXD50000126880*

Option manuals and guides	
ACX-AP-x assistant control panels user's manual	*3AUA0000085685*
Drive composer Start-up and maintenance PC tool user's manual	*3AUA0000094606*
Manuals and quick guides for I/O extension modules, fieldbus adapters, encoder interfaces, etc.	

You can find manuals and other product documents in PDF format on the Internet. See section *Document library on the Internet* on the inside of the back cover. For manuals not available in the Document library, contact your local ABB representative.

Supplement

ACS880 override control program (option +N5450)

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Quick start-up guide

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Introduction to the manual

Contents of this chapter

The chapter describes the contents of this manual. It also contains information on the applicability, safety and intended audience.

Purpose of this guide

This supplement describes the difference between ACS880 override control program and ACS880 primary control program. It also describes the additional override control program related parameters in the supply unit control programs. These are relevant only for those drives that have a separate supply unit.

Applicability

This supplement applies to the ACS880 override control program, v1.20 or later. For other parameter settings, see the *List of related manuals*.

Control program	Version
ACS880 primary control program	AOILX v1.20 or later
ACS880 diode supply control program	AODLX 1.20 or later
ACS880 IGBT supply control program	AOSLX 1.20 or later
ACS880 IGBT supply control program 2Q	AOLLX 1.20 or later

Note: IGBT supply units of ACS880-11/-31/-14/-34 and the same units in cabinet-installed drives ACS880-17/-37 (frames R8 and R11) does not offer same parameters as other supply units. In those supply units, a separate Override control program is

not needed at all. However, make sure you have the following supply unit firmware versions:

- AISK8 v2.12.0.5 or later (for frames R3, R6 and R8) and
- AISL6 v3.00.100.2 or later (for frame R11).

Safety

Follow all safety instructions delivered with the drive.

- Read the **complete safety instructions** before you install, commission, or use the drive. The complete safety instructions are given at the beginning of the hardware manual for the single drives, or in the *Safety instructions [3AUA0000102301 (English)]* for the multidrives and multidrives modules.
- Read the **software function specific warnings and notes** before changing the default settings of the function. For each function, the warnings and notes are given in this manual in the section describing the related user-adjustable parameters.

Target audience

This supplement is intended for people who design, commission, or operate the drive system.

Contents

The manual consists of following chapters:

Quick start-up guide provides the basic start-up sequence of the drive and additional alternative checklists for starting up the drive.

Default control connections describes the default control connections of the ACS880 override control program.

Program features describes the features that are added to ACS880 override control program compared with ACS880 primary control program.

Parameters lists the parameter differences between ACS880 primary control program and ACS880 override control program.

Supply unit parameter data lists additional override function parameters for the supply control programs.

Fault tracing lists the additional warning and fault messages (including possible causes and corrective actions) specific to the Override control program.

Control chain diagrams presents the reference chains specific to the Override control program.

Example configurations presents the override control program IO control and fieldbus configurations.

Cybersecurity disclaimer

This product is designed to be connected to and to communicate information and data via a network interface. It is Customer's sole responsibility to provide and continuously ensure a secure connection between the product and Customer network or any other network (as the case may be). Customer shall establish and maintain any appropriate measures (such as but not limited to the installation of firewalls, application of authentication measures, encryption of data, installation of anti-virus programs, etc) to protect the product, the network, its system and the interface against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information. ABB and its affiliates are not liable for damages and/or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information.

Related documents

See the *List of related manuals* on the inside of the front cover.

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Quick start-up guide

Contents of this chapter

This chapter contains the basic start-up sequence of the drive and additional alternative checklists for starting up the drive.

Before you start

Make sure the drive is mechanically and electrically installed as described in the appropriate *Quick installation guide* and/or *Hardware manual*.

Safety

WARNING! All electrical installation and maintenance work on the drive must be carried out by qualified electricians only.

Never work on the drive, the brake chopper circuit, the motor cable or the motor when power is applied to the drive. Always make sure by measuring that no voltage is actually present.

WARNING! Make sure that the machinery into which the drive with the Override control program is integrated fulfills the personnel safety regulations. Note that the frequency converter (a Complete Drive Module or a Basic Drive Module, as defined in IEC 61800-2 with the Override control program), is not considered as a safety device mentioned in the European Machinery Directive and related harmonized standards. Thus, the personnel safety of the complete machinery must not be based on a specific frequency converter feature (such as the Override control program), but it has to be implemented as defined in the application specific regulations.

Drive start-up

Pre-requisite

Before start-up, check that all control signals required for the activation of Override control mode are in “inactive” (false) state:

- DI5
- Fieldbus override control word bit 0 (parameter *09.01 Override control word*)

In addition, do the following:

- Start-up the drive according to *ACS880 primary control program quick start-up guide [3AUA0000098062 (English)]*.
- If synchronous reluctance motor is used, see also *Supplement SynRM motor control program [3AXD50000026332 (English)]*. With SynRM motor, set parameter *21.13 Autophasing mode = Standstill 1.*
- Make sure that Override mode is deactivated in the supply unit control program (parameter *109.01*, bit 1).

Override control start-up

This section contains the startup instructions for a drive with the Override control program.

Override control program parameter settings

	Safety
☐	**WARNING!** Obey all safety instructions for the drive. Only qualified electricians are allowed to start up the drive.
	Parameter settings
☐	Restore the default parameter settings. • *96.06 Parameter restore*, select *Restore defaults.*
☐	Set the speed or frequency references and limits in override mode. • *74.03 Override speed ref 1* with DTC, scalar motor control mode (*99.04*). • *74.04 Override speed ref 2* with DTC, scalar motor control mode (*99.04*). • If you select Hz for the reference unit in the scalar motor control mode (*19.20*), set constant frequency references *74.05*...*74.06*. • *74.16*...*74.19* Override minimum and maximum speed and frequency limits.
☐	Consider taking the output current limitation due to overtemperature in use. • *74.07 Ambient temperature limit*, • *74.08 Inverter temperature limit* and • *74.09 Max current above temp limit*. For more information on the function, see section *Override control interface* (page *21*).
☐	Consider tuning the drive switching frequency value. This is not a must: the factory default value works as it is. However, in certain cases you can also choose to tune the switching frequency to maximize either the motor load capacity or the drive load capacity. As a thumb rule: • Increasing the switching frequency decreases motor losses (and temperature) and increases drive losses (and temperature). • Decreasing the switching frequency increases motor losses (and temperature) and decreases drive losses (and temperature).

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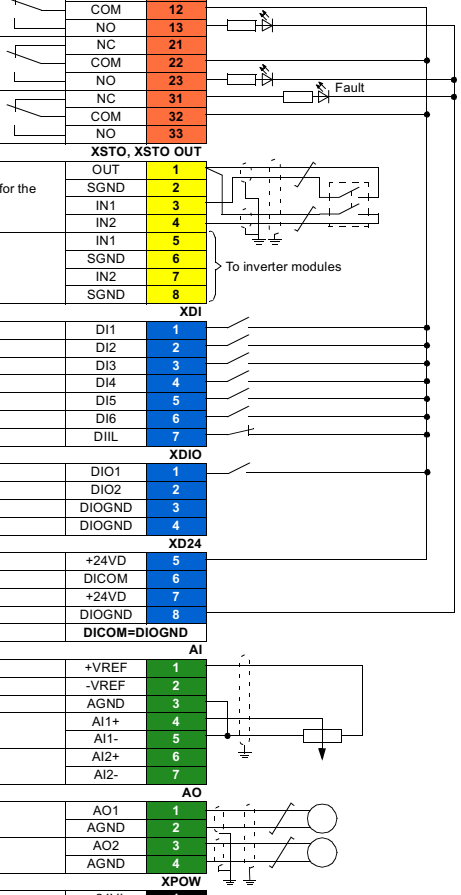
Default control connections

Contents of this chapter

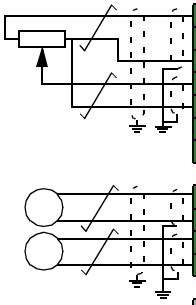
The chapter describes default control connections of the ACS880 override control program for two possible control units (BCU and ZCU) used with ACS880 drives.

Default control connections of Override control program (BCU) for inverter unit (INU)

Drive-to-drive link		**XD2D**
Drive-to-drive link	B	1
	A	2
	BGND	3
	Shield	4
RS485 connection		**X485**
Not in use	B	5
	A	6
	BGND	7
	Shield	8
Relay outputs		**XRO1…XRO3**
Ready 250 V AC / 30 V DC 2 A	NC	11
	COM	12
	NO	13
Running 250 V AC / 30 V DC 2 A	NC	21
	COM	22
	NO	23
Faulted(-1) 250 V AC / 30 V DC 2 A	NC	31
	COM	32
	NO	33
Safe torque off		**XSTO, XSTO OUT**
Safe torque off input. Both circuits must be closed for the drive to start.	OUT	1
	SGND	2
	IN1	3
	IN2	4
Safe torque off output to inverter modules	IN1	5
	SGND	6
	IN2	7
	SGND	8
Digital inputs		**XDI**
Stop (0) / Start (1)	DI1	1
Forward (0) / Reverse (1)	DI2	2
Reset	DI3	3
Override constant speed or freq ref 1 (0) / ref 2 (1)	DI4	4
Activate override control (0---> On)	DI5	5
By default not in use.	DI6	6
Run enable	DIIL	7
Digital input/outputs		**XDIO**
Input: Deactivate override control (0-->1 = Off)	DIO1	1
Output: Running	DIO2	2
Digital input/output ground	DIOGND	3
Digital input/output ground	DIOGND	4
Auxiliary voltage output		**XD24**
+24 V DC 200 mA	+24VD	5
Digital input ground	DICOM	6
+24 V DC 200 mA	+24VD	7
Digital input/output ground	DIOGND	8
Ground selection switch		**DICOM=DIOGND**
Analog inputs, reference voltage output		**AI**
10 V DC, R_L 1…10 kohm	+VREF	1
-10 V DC, R_L 1…10 kohm	-VREF	2
Ground	AGND	3
Speed reference 0(2)…10 V, R_{in} > 200 kohm	AI1+	4
	AI1-	5
By default not in use. 0(4)…20 mA, R_{in} = 100 ohm	AI2+	6
	AI2-	7
Analog outputs		**AO**
Motor speed rpm 0…20 mA, R_L < 500 ohm	AO1	1
	AGND	2
Motor current 0…20 mA, R_L < 500 ohm	AO2	3
	AGND	4
External power input		**XPOW**
24 V DC, 2.05 A Two supplies can be connected for redundancy.	+24VI	1
	GND	2
	+24VI	3
	GND	4
Safety functions module connection		**X12**
Control panel connection		**X13**
Memory unit connection		**X205**
XETH		**Not in use**



Default control connections of Override control program (ZCU) for inverter unit (INU)



XPOW	External power input	
1	+24VI	24 V DC, 2 A
2	GND	
XAI	Reference voltage and analog inputs	
1	+VREF	10 V DC, R_L 1…10 kohm
2	-VREF	-10 V DC, R_L 1…10 kohm
3	AGND	Ground
4	AI1+	**Speed reference**
5	AI1-	0(2)…10 V, R_{in} > 200 kohm
6	AI2+	By default not in use.
7	AI2-	0(4)…20 mA, R_{in} > 100 ohm
XAO	Analog outputs	
1	AO1	**Motor speed rpm**
2	AGND	0…20 mA, R_L < 500 ohm
3	AO2	**Motor current**
4	AGND	0…20 mA, R_L < 500 ohm
XD2D	Drive-to-drive link	
1	B	Drive-to-drive link
2	A	
3	BGND	
XRO1, XRO2, XRO3	Relay outputs	
1	NC	**Ready** 250 V AC / 30 V DC 2 A
2	COM	
3	NO	
1	NC	**Running** 250 V AC / 30 V DC 2 A
2	COM	
3	NO	
1	NC	**Faulted(-1)** 250 V AC / 30 V DC 2 A
2	COM	
3	NO	
XD24	Digital interlock	
1	DIIL	Digital interlock. By default, not in use.
2	+24VD	+24 V DC 200 mA
3	DICOM	Digital input ground
4	+24VD	+24 V DC 200 mA
5	DIOGND	Digital input/output ground
XDIO	Digital input/outputs	
1	DIO1	Input: Deactivate override control (0-->1 = Off)
2	DIO2	Output: Running
XDI	Digital inputs	
1	DI1	Stop (0) / Start (1)
2	DI2	Forward (0) / Reverse (1)
3	DI3	Reset
4	DI4	Override constant speed or freq ref 1 (0) / ref 2 (1)
5	DI5	Activate override control (0-->1 = On)
6	DI6	Not in use as default
XSTO	Safe torque off circuits must be closed for the drive to start. See *Hardware manual* of drive.	
X12	Safety options connection	
X13	Control panel connection	
X205	Memory unit connection	

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Program features

Contents of this chapter

This chapter describes the additional features of Override control program for the ACS880 primary control program.

Overview of the override control program

The override control program is used in critical applications like tunnel fans in emergency situations. The program maximizes the reliability to continue operation of the fans. It is possible to continue operation until the motor or drive cannot function anymore. The followings conditions are considered for operating the program:

- Ordinary start/stop commands are disabled from different sources. For example, control panel, I/O and fieldbus.
- Ordinary speed or frequency references are disabled. Only override speed or frequency references are valid.
- Override mode continues automatically after supply power break, even though external control cables to digital inputs are disconnected.
- The program contains two specific override speed references (constant speed values set by parameters) including direction of speed change by digital I/O or polarity of speed or frequency reference.
- In the Primary control program, control location Ext2 is reserved for the Override control when “active”.
- IEC programming (option +N8010) is not supported.

Protection and maintenance

The override program includes the following conditions for protection and maintenance:

- Most of the protections are disabled during override mode i.e. only the fatal faults will trip the drive. If some hardware based faults activate, automatic control unit booting resets fault when override mode is active.
- Protections are also disabled in drive with BCU controlled supply unit in override mode.
- Includes test mode where fault diagnostics or fieldbus is activated to help regular maintenance procedures.

Temperature protection

The override program includes the following conditions for temperature protections:

- There is a possibility to limit motor current in case of excessive ambient temperature or excessive drive/inverter temperature.
- Possibilities to adjust switching frequency in override mode effecting temperature rise of motor or drive/converter module.
- The control program can automatically limit the drive output current if the drive internal temperature or the drive ambient temperature increase excessively. You can define the temperature limits and the maximum current by parameters *74.07 Ambient temperature limit*, *74.08 Inverter temperature limit* and *74.09 Max current above temp limit*. If you want to inactivate the limitation, use current value that exceeds the output current rating of a drive.
- Current limitation decreases the motor and the drive stress in occasional extreme temperature. It can even prevent a permanent damage due to overheating. For example, if you prevent the drive fault trip due to the motor overload protection function, you can still allow to decrease the motor load in exceptionally high temperature conditions as it can save the motor and avoid a complete operation break.

Safety features

The override program includes the following conditions for safety:

- STO function works normally during override control.
- Emergency stop function is always valid if activated by parameter or fieldbus control word.

  Note: During override control, fieldbus control word is not followed.
- Functional safety options FSO-12, FSO-21 and FSE-31 are not supported.

Override control interface

The control program forces the control location to external control location Ext2, when the override control mode is active. During normal operation, that is when the override control is inactive, Ext1 and Ext2 can be used normally.

Note: When drive exits the Override control mode,

- drive is ready to start in the normal mode.
- previous external control location is restored.

Settings

Parameter group *74 Override control* (page *32*).

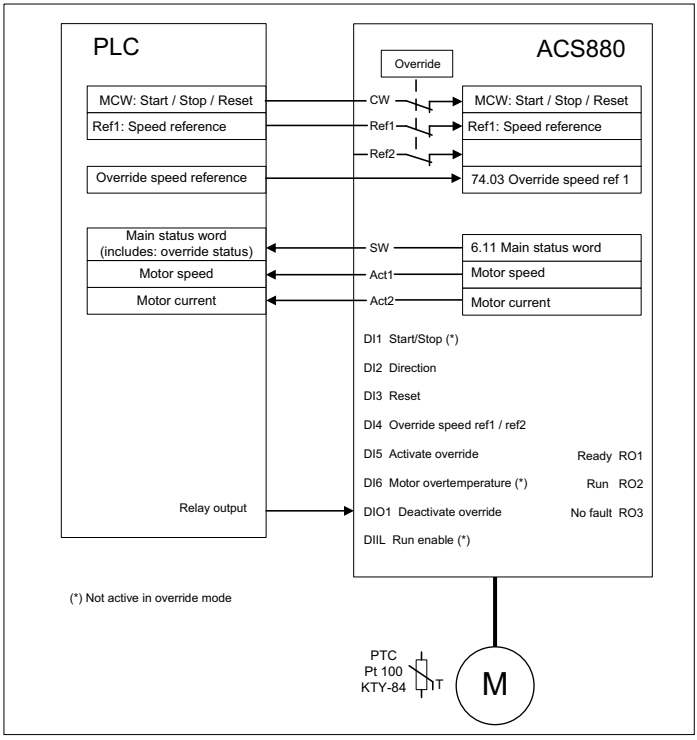
Warnings: -

Faults: -

Override control functions

Override control mode – deactivates possible fault trips and forces the control place to Ext2 (parameter *19.11 Ext1/Ext2 selection* = *Ext2*) with fieldbus control MCW, Ref1 and Ref2 are not valid.

Start/stop and speed reference – The I/O control start/stop and speed references are not valid and local control device is not active for start/stop and speed reference.



- *19.14 Ext2 control mode* = Speed (2)
- *19.17 Local control disable* = Yes (1)
- *20.06 Ext2 commands* = In1 Start (1)
- *20.07 Ext2 start trigger type* = Level (1)
- *20.08 Ext2 in1 source* = Selected (1)
- *20.12 Run enable 1 source* = Selected (1)
- *20.19 Enable start command* = Selected (1)

Override speed and frequency references are constant speed references defined with parameters *74.03*...*74.06*. The values are saved to permanent memory when entered by control panel or Drive composer PC tool. Note that references from

fieldbus are not saved to permanent memory. Override speed references are ramped to speed limits *30.11 Minimum speed* and *30.12 Maximum speed*.

Protection over malfunction – If non-resettable faults like malfunction in electronics becomes active, override application may restart the drive by booting the control unit.

Temperature limit – The control program activates current limitation function based on the ambient and drive temperature measurements. See parameters *74.07 Ambient temperature limit* to *74.09 Max current above temp limit* (page *33*).

Settings

Parameters *19.14 Ext2 control mode* (page *35*) *19.17 Local control disable* (page *35*), *20.06 Ext2 commands* (page *35*), *20.07 Ext2 start trigger type* (page *35*), *20.08 Ext2 in1 source* (page *35*), *20.12 Run enable 1 source* (page *35*), *20.19 Enable start command* (page *35*), *74.07 Ambient temperature limit* (page *33*), *74.09 Max current above temp limit* (page *33*) and *74.20 Control unit boot delay* (page *34*).

Warnings: -

Faults: -

Activating override mode

The Override control mode can be activated using any of these methods:

- digital input DI5
- parameter *09.01 Override control word*, bit 0.

The drive remains in override control mode until it receives the override off command from digital input DIO1 or *09.01 Override control word*, bit 1-Deactivate override, for example, through fieldbus. Override on command has higher priority than the Override off command and therefore it must be controlled off before the Override off command. The motor continues running without interruption if it is already running before the activation of the override control mode. If drive was faulted when activating the Override mode, fault is reset internally.

Control signal command (status)	
Override on	Digital input DI5 (0 --> 1) or Fieldbus *09.01 Override control word*, bit 0-Activate Override
Override off	Digital input DIO01 (0 --> 1) or Fieldbus *09.01 Override control word*, bit 1-Deactivate Override

The override control mode continues automatically after the AC power supply break. If I/O cable connections or fieldbus communication are lost, example, by fire, the drive continues using Override ref1, DI2 = FALSE (forward direction) and DI4 = FALSE (Reference 1).

Settings

Parameter: *09.01 Override control word* (page *31*)

Warnings: *E200 Override active* (page *42*)

Faults: -

Speed or frequency reference

You can define the speed or frequency references, constant override speeds and frequencies for the override control:

Speed and frequency reference limits:

- *74.16 Override minimum speed limit*
- *74.17 Override maximum speed limit*
- *74.18 Override minimum frequency limit*
- *74.19 Override maximum frequency limit*

Constant override speeds and frequencies:

- Parameter *74.03 Override speed ref 1* with asynchronous, permanent magnet and SynRM motors
- Parameter *74.04 Override speed ref 2* with asynchronous, permanent magnet and SynRM motors
- Parameter *74.05 Override frequency ref 1* with scalar motor control mode and Hz reference selected
- Parameter *74.06 Override frequency ref 2* with scalar motor control mode and Hz reference selected
- Digital input DI4 selects either ref 1 (FALSE) or ref 2 (TRUE) of *74.03*...*74.06*.
- Digital input DI2 is used to direction control (FALSE = forward, TRUE = backward) in Normal and override mode.
- When DI2 = FALSE, Override speed/freq references 1 and 2 are multiplied by 1
- When DI2 = TRUE, Override speed/freq references 1 and 2 are multiplied by -1

You can also select Override speed reference source with parameter *74.22 Override speed ref source sel*. This makes it possible to use, for example, the Process PID output as reference.

Settings

Parameter group *74 Override control* (page *32*).

Warnings: -

Faults: -

Activating override control mode in the supply unit

Some ACS880 products have separate inverter and supply units that are controlled with their own control units. For using override control applications:

- you can activate or inactivate the override control mode in the inverter with the Override control program.
- the inverter activates or inactivates the override control function in the supply unit according its own status.

In a single drive, there is a communication link (DDCS) between the supply unit and inverter unit. The inverter unit controls the supply unit using the control word (CW) bit 12. See parameters *6.40* and *6.41*.

When you activate the override control in the supply unit, it remains active until the override off command is given from digital input DIO1, through DDCS from INU or through fieldbus.

If override mode in the supply unit is activated through its own digital input (DI5 in ISU and DIO2 in DSU), then supply unit should not receive commands from inverter unit through DDCS link. Check that parameter *195.20*, bit 11 is not set. If bit is set, supply unit receives its start command only from inverter unit through DDCS link.

For parameter description, see supply control program firmware manuals in *List of related manuals*.

Control signal command (status)	
Override on	Parameter *06.39 Internal state machine LSU CW* user bit 0 (user bit 0 is actually bit 12 in LSU CW) from INU to LSU (*6.40 LSU CW user* bit 0 = *09.02 Override status word*, bit 4-Override activation request). Digital input DI5 (0 --> 1) or Fieldbus *109.01 Override control word*, bit 0-Activate Override.
Override off	Parameter *06.39 Internal state machine LSU CW* user bit 1 (user bit 1 is actually bit 13 in LSU CW) from INU to LSU (*6.41 LSU CW user* bit 1 = *09.02 Override status word* bit 5-Override deactivation request) Digital input DIO01 (0 --> 1) or Fieldbus *109.01 Override control word*, bit 1-Deactivate Override.

Override control mode automatically continues after the AC power supply break.

Settings

Parameters *09.02 Override status word* (page *31*) and *109.01 Override control word* (page *38*).

Warnings: -

Faults: -

Diagnostics in INU

Parameter *09.02 Override status word*, bit 0-Override active and bit 1-Override test mode status can be connected to:

- relay or digital output in parameter group 10 and group 11 by using signal *09.02 Override status word*, bit 0-Override mode active.
- free bits of *6.11 Main status word* for fieldbus by parameters *6.29*...*6.33*.

Settings

Parameter *09.02 Override status word* (page *31*).

Warnings: -

Faults: -

Diagnostics in supply unit

Parameter *109.02 Override status word*, bit 0-Override active and bit 1-Override test mode status can be connected to:

- relay or digital output in parameter group 110 and group 111 by using signal *109.02 Override status word*, bit 0-Override mode active.
- free bits of *106.11 Main status word* for fieldbus by parameters *106.29*...*106.33*.

Settings

Parameter *109.02 Override status word* (page *38*).

Warnings: -

Faults: -

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Parameters

Contents of this chapter

This chapter lists the parameter difference between ACS880 override control program and ACS880 primary control program. For the description of parameters that are the same in both programs, see *ACS880 primary control program firmware manual* [*3AUA0000085967* (English)].

Terms and abbreviations

Term	Definition
Actual signal	Type of *Parameter* that is the result of a measurement or calculation by the drive, or contains status information. Most actual signals are read-only, but some (especially counter-type actual signals) can be reset.
Def	(In the following table, shown on the same row as the parameter name) The default value of a *Parameter*. **Note:** Certain drive hardware or optional equipment may require different default values.
FbEq16	(In the following table, shown on the same row as the parameter range, or for each selection) 16-bit fieldbus equivalent: The scaling between the value shown on the panel and the integer used in communication when a 16-bit value is selected for transmission to an external system. A dash (-) indicates that the parameter is not accessible in 16-bit format.
Other	The value is taken from another parameter. Choosing “Other” displays a parameter list in which the user can specify the source parameter.
Other [bit]	The value is taken from a specific bit in another parameter. Choosing “Other” displays a parameter list in which the user can specify the source parameter and bit.
Parameter	Either a user-adjustable operating instruction for the drive, or an *Actual signal*.
p.u.	Per unit

Summary of parameter groups

Group	Contents	Page
09 Override control and status	Control word and status word related to the override control program.	*31*
11 Standard DIO, FI, FO	Configuration of digital input/outputs and frequency inputs/outputs.	*35*
19 Operation mode	Selects the local and external control location source.	*35*
20 Start/stop/direction	Start/stop/direction and run/start/jog enable signal source selection.	*35*
22 Speed ref sel	The default value of the following parameters are changed by the override control program.	*36*
23 Speed ref ramp	The default value of the following parameters are changed by the override control program.	*36*
31 Fault functions	The default value of the following parameters are changed by the override control program.	*36*
74 Override control	Override specific parameter settings.	*32*

Parameter listing

No.	Name/Value	Description	Default; FbEq (16b/32b)
09 Override control and status		Control word and status word related to the override control program. See section *Activating override mode* (page *24*).	
09.01	Override control word	Shows the bits (commands) of the internal Override control word. Depending on the command source selections, you can set these bits: • from a PLC with bit 0 of its Override control word (*09.01*) that sends to the drive.	1 = 1 / -

Bit	Name	Information
0	Activate override	0 --> 1 = Override mode is activated by rising edge. This is used for fieldbus control.
		1 --> 0 = No function.
1	Deactivate override	0 --> 1 = Override mode is deactivated by rising edge. This is used for fieldbus control. **Note:** Bit 0 must be in FALSE state before deactivation affects.
		1 --> 0 = No function.
2...15	-	Not in use

09.02	Override status word	Shows the bits (status indications) of the Override control program status word.	1 = 1 / -

Bit	Name	Information
0	Override mode active	1 = Override mode is activated
1	Test mode active	1 = Override test mode is activated. See parameter *74.02 Override test mode* (page *32*).
2	Current limitation active	1 = Current limitation is active. See par. *74.07 Ambient temperature limit...74.09 Max current above temp limit* (page *33*).
3	Sw freq limitation active	1 = IGBT switching frequency limitation is active in Override mode. See parameter *74.12 Override mode switching freq ref* (page *33*).
4	Override activation request	1 = Activation of override mode is requested
5	Override deactivation request	1 = Deactivation of override mode is requested
6	Last FB ref in use from memory	1 = Override speed or frequency reference is read from internal memory after the supply power break if • fieldbus communication is lost • override control was active before power break • time of communication loss time out is elapsed from selected fieldbus

No.	Name/Value	Description	Default; FbEq (16b/32b)
		Bit / Name / Information 7 / User param copied / 1 = User parameters have been copied. Certain user parameters are copied internally before entering to override mode where parameter values are controlled by override application. 8 / User param restored / 1 = User parameters restored. After the exit from override mode earlier copied user's parameters are restored. 9...15 / Not in use	
74 Override control		Override control specific parameter settings. See sections *Override control interface* (page *21*), *Faults: -* (page*27*),	
74.01	Override status	Shows the Override status. This information is saved during power fail to flash memory and returned in next power on.	
	0	Override mode is inactive.	0
	1	Override mode is active.	1
74.02	Override test mode	Activates/inactivates the Override control test mode. The fault diagnostics can be activated for test purposes when the Override is already activated. When Override mode is activated and then if test mode is activated for testing purpose, the warning *E200 Override active* is deactivated to show that, e.g. fault masking is no longer active. This parameter value is not saved to permanent memory.	0
	Bit 0	Override test mode.	
	Bit 1...15	Not in use.	
74.03	Override speed ref 1	Defines the Override speed reference 1 when speed (rpm) type of reference is used if DI4 is off.	0 rpm
	-30000.00... 30000 rpm	Speed reference in rpm.	See par. 46.01; - / 100 = 1 rpm
74.04	Override speed ref 2	Defines the Override speed reference 2 when speed (rpm) type of reference is used if DI4 is on.	0 rpm
	-30000.00... 30000 rpm	Speed reference in rpm.	See par. 46.01; - / 100 = 1 rpm
74.05	Override frequency ref 1	Defines the Override frequency reference 1 when frequency (Hz) type of reference is selected in scalar mode by parameter *19.20 Scalar control reference unit*.	0 Hz
	-500.00... 500.00 Hz	Frequency reference in Hz.	See par. 46.02; - / 100 = 1 Hz
74.06	Override frequency ref 2	Defines the Override frequency reference 2 when frequency (Hz) type of reference is selected in scalar mode by parameter *19.20 Scalar control reference unit*.	
	-500.00... 500.00 Hz	Frequency reference in Hz.	See par. 46.02; - / 100 = 1 Hz

No.	Name/Value	Description	Default; FbEq (16b/32b)
74.07	Ambient temperature limit	Defines the ambient temperature limit where drive current is limited by ramping to a value of parameter *74.09 Max current above temp limit* (page *33*), when *1.31 Ambient temperature* rises above this limit.	100 °C
	-40...120 °C	Ambient temperature limit.	1 = 1°C / 1 = 1°C
74.08	Inverter temperature limit	Defines the inverter temperature limit where the output current is limited to parameter *74.09 Max current above temp limit* (page *33*), when *5.11 Inverter temperature* rises above this limit.	100%
	-40... 160%	Relative inverter temperature limit.	1 = 1% / 1 = 1%
74.09	Max current above temp limit	Defines the maximum current above the temperature limit. The maximum current when override mode is active and either temperature limit is reached. See parameters *74.07 Ambient temperature limit* and *74.08 Inverter temperature limit* (page *33*). Power unit type limits the maximum value.	PU specific maximum value
	0...30000 A	Maximum current in override mode.	10 = 1A / 100 = 1A
74.12	Override mode switching freq ref	Defines the override mode switching frequency reference. The value is written to *97.01 Switching frequency reference* when override mode is activated. **Note:** Minimum and maximum limits in switching frequencies reference are hardware dependent in different frames.	HW specific. See par. 74.10.
	1.000...16.000 kHz	Switching frequency reference.	1000 = 1kHz / 1000 = 1kHz
74.16	Override minimum speed limit	Minimum speed reference limit in override mode.	-1500.00rpm
	-30000.00... 30000.00 rpm	Override minimum speed limit.	See par. 46.01; - / 100 = 1rpm
74.17	Override maximum speed limit	Maximum speed reference limit in override mode.	1500.00 rpm
	-30000.00... 30000.00 rpm	Override maximum speed limit.	See par. 46.01; - / 100 = 1 rpm
74.18	Override minimum frequency limit	Defines the minimum frequency reference limit in override mode if frequency (Hz) type of reference is selected in scalar control by parameter*19.20 Scalar control reference unit*. As a default, scalar control uses rpm.	-50.00Hz
	-500.00... 500.00 Hz	Override minimum frequency limit.	See par. 46.02; - / 100 = 1Hz
74.19	Override maximum frequency limit	Defines the maximum frequency reference limit in override mode if frequency (Hz) type of reference is selected in scalar control by parameter *19.20 Scalar control reference unit*. As a default, scalar uses rpm.	50.00 Hz
	-500.00... 500.00 Hz	Override maximum frequency limit.	See par. 46.02; - / 100 = 1 Hz

No.	Name/Value	Description	Default; FbEq (16b/32b)
74.20	Control unit boot delay	Defines the time delay (T_{on}) for the drive to perform restarting of control unit (xCU) software. The counting time begins when any non-resettable fault becomes active. This is used to reset possible permanent type of faults like over voltage, under voltage, earth fault, over current, and short circuit or other abnormal conditions detected by hardware which cannot be masked off in override mode. If there is no active fault and Override mode is active, but drive is not running, drive waits for 2 x 74.20 boot time and tries to get the system running by rebooting the control unit.	30 s
	10 ... 240 s	Time delay	1 = 1s / 10 = 1 s
74.22	Override speed ref source sel	Selects the source for Override speed reference input.	0
	Override speed ref 1 or 2	Override speed reference 1 or 2	0
	40.01 Process PID output actual	See parameter *40.01 Process PID output actual*.	1
	Other [bit]	Source selection (see *Terms and abbreviations* on page *30*).	

Parameters used by override control program

The following parameters of the ACS880 primary control program are used with Override mode activated.

No.	Name/Value	Description	Default; FbEq (16b/32b)
11 Standard DIO, FI, FO		Configuration of digital input/outputs and frequency inputs/outputs.	Forced value
11.05	DIO1 function	Deactivates the override mode. DIO function is used as a fixed digital input.	Input (1)
19 Operation mode		Selects the local and external control location source.	Forced value
19.11	Ext1/Ext2 selection	Used by the override control program.	Ext2 (1)
19.14	Ext2 control mode	Used by the override control program.	Speed (2)
19.17	Local control disable	Disables local control. If the drive is locally controlled and when the override mode is activated, the drive is switched to remote control using Ext2 control place.	Yes (1)
20 Start/stop/direction		Start/stop/direction and run/start/jog enable signal source selection.	Forced value
20.06	Ext2 commands	Used by the override control program.	In1 Start (1)
20.07	Ext2 start trigger type	Used by the override control program.	Level (1)
20.08	Ext2 in1 source	Used by the override control program.	Selected (1)
20.12	Run enable 1 source	Used by the override control program.	Selected (1)
20.19	Enable start command	Used by the override control program.	Selected (1)
40 Process PID set 1		Parameter value for process PID control	Forced value
40.01	Process PID output actual	Displays the output of the process PID controller. This parameter is read-only. The unit is selected by parameter *40.12 Set 1 unit selection*.	-

Changed firmware default values by override control program

The following default parameter settings of the ACS880 primary control program are changed during the override mode.

No.	Name/Value	Description	Default; FbEq (16b/32b)
22 Speed ref sel		The default value of the following parameters are changed by the override control program.	Default value
22.22	Const speed sel1	Default value changed from DI5 to Not selected.	Not selected (0)
23 Speed ref ramp		The default value of the following parameters are changed by the override control program.	Default value
23.11	Ramp set selection	Default value changed from DI4 to Acc/Dec time 1.	Acc/Dec time 1 (0)
31 Fault functions		The default value of the following parameters are changed by the override control program.	Default value
31.12	Autoreset selection	Default value changed from 0000h to 0400h.	Bit 10-Selectable fault
31.13	User selectable fault	Default value changed to Line side unit faulted.	0x7583
31.14	Number of trials	Default value changed to value 1.	1

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Supply unit parameter data

Contents of this chapter

This chapter describes the Override control program specific parameters for the supply unit control programs. These parameters are not included in the supply unit control program manuals. This chapter is relevant only if there is a separate supply unit in the drive.

Summary of parameter groups in supply unit

Group	Contents	Page
109 Override control and status	Shows the control word and status word related to the override control program in supply unit.	*38*
174 Override control	Override specific parameter settings related to the override control program in supply unit.	*38*

Parameter groups

No.	Name/Value	Description	FbEq
109 Override control and status		Shows the control word and status word related to the override control program in supply unit. See section *Activating override control mode in the supply unit* (page *26*).	
109.01	Override control word	Shows the bits (commands) of the internal Override control word. Depending on the command source selections, you can set these bits: • from a PLC with bit b0 of its Override control word (*09.01*) that it sends to the drive.	1 = 1

Bit	Name	Information
0	Activate override	0 --> 1 = Override mode is activated by rising edge. This is used for fieldbus control.
		1 --> 0 = No function.
1	Deactivate override	0 --> 1 = Override mode is deactivated by rising edge. This is used for fieldbus control.
		1 --> 0 = No function. Bit 0 state has no effect for deactivating.
2...15	-	Not in use

109.02	Override status word	Shows the bits (status indications) of the Override control program status word.	1 = 1

Bit	Name	Information
0	Override mode active	1 = Override mode is activated
1	Test mode active	1 = Override test mode is activated. See parameter *174.02 Override test mode* (page *38*).
2...15	-	Not in use

174 Override control		Override specific parameter settings related to the override control program in supply unit.	
174.01	Override status	Shows the Override status. This information is saved during power fail to flash memory and returned in next power On.	
	0	Override mode is inactive.	0
	1	Override mode is active.	1
174.02	Override test mode	Activates/inactivates the Override control test mode The fault diagnostics can be activated for test purposes when Override is already activated.	0
	Bit 0	Override test mode.	
	Bit 1...15	Not in use.	

No.	Name/Value	Description	FbEq
174.20	Control unit boot delay	Defines the time delay (T_{on}) for the drive to perform restarting of control unit (xCU) software. Counting of the time begins when any non-resettable fault becomes active. This is used to reset possible permanent type of faults like over voltage, under voltage, earth fault, over current, and short circuit or other abnormal conditions detected by the hardware which cannot be masked off in override mode.	30 s
	10 ... 240 s	Time delay.	1 = 1s

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Fault tracing

Contents of this chapter

The chapter lists the warning and fault messages (including possible causes and corrective actions) which differ from ACS880 primary control program described in *ACS880 primary control program firmware manual* [3AUA0000085967 (English)] and supply unit control programs listed in *ACS880 diode supply control program [3AUA0000103295 (English)]* and *ACS880 IGBT supply control program firmware manual [3AUA0000131562 (English)]*.

Safety

WARNING! Only qualified electricians are allowed to service the drive. Read the Safety instructions on the first pages of the hardware manual for the single drives, or in the *Safety instructions [3AUA0000102301 (English)]* for the multidrives and multidrives modules before working on the drive.

Indications

Warnings and faults

A warning or fault message on the panel display indicates abnormal drive status. Most of the warnings and faults causes can be identified and corrected using this information. If not, contact your local ABB representative.

Warning message in ACS880 primary control program

Code	Warning	Cause	What to do
E200	Override active	Indicates that override mode is activated by I/O or through fieldbus.	Deactivate override control when the situation is over.

Warning messages in the supply unit control programs

The following are the warning messages generated in supply unit control programs.

Code	Warning	Cause	What to do
D200	Override active	Indicates that override mode is activated by supply unit I/O, through DDCS from INU or fieldbus.	Deactivate override control when situation is ready.
D201	Override TEST MODE	Indicates that override test mode is activated by parameter *174.02 Override test mode*.	Deactivate override control when situation is over. **Note:** Test mode is for temporary test to indicate possible faults. The value in parameter *174.02* is not saved to flash memory. After the next power-on, test mode is not valid.

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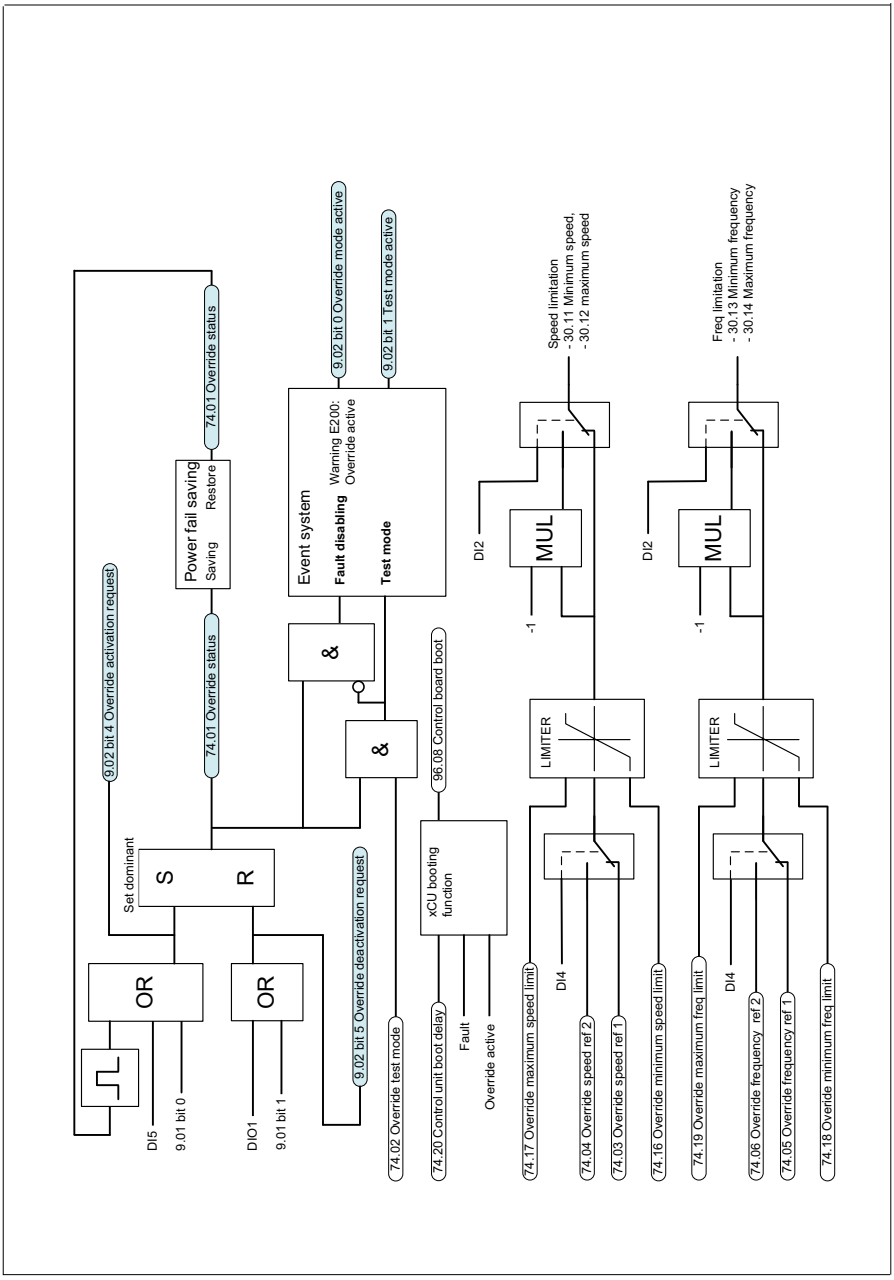
Control chain diagrams

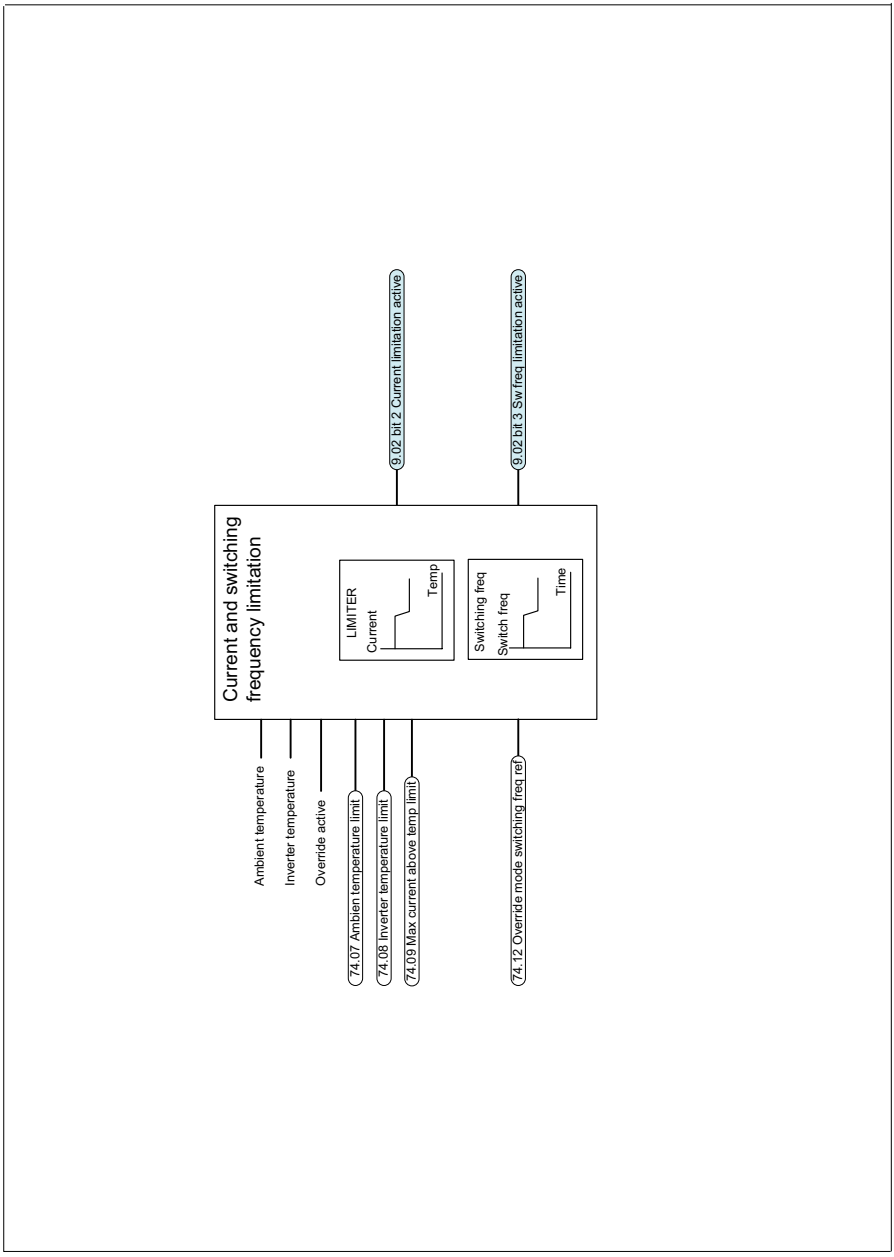
Contents of this chapter

The chapter presents the override control program reference chain diagrams of the drive. The control chain diagrams can be used to trace how parameters interact and where parameters have an effect within the drive parameter system.

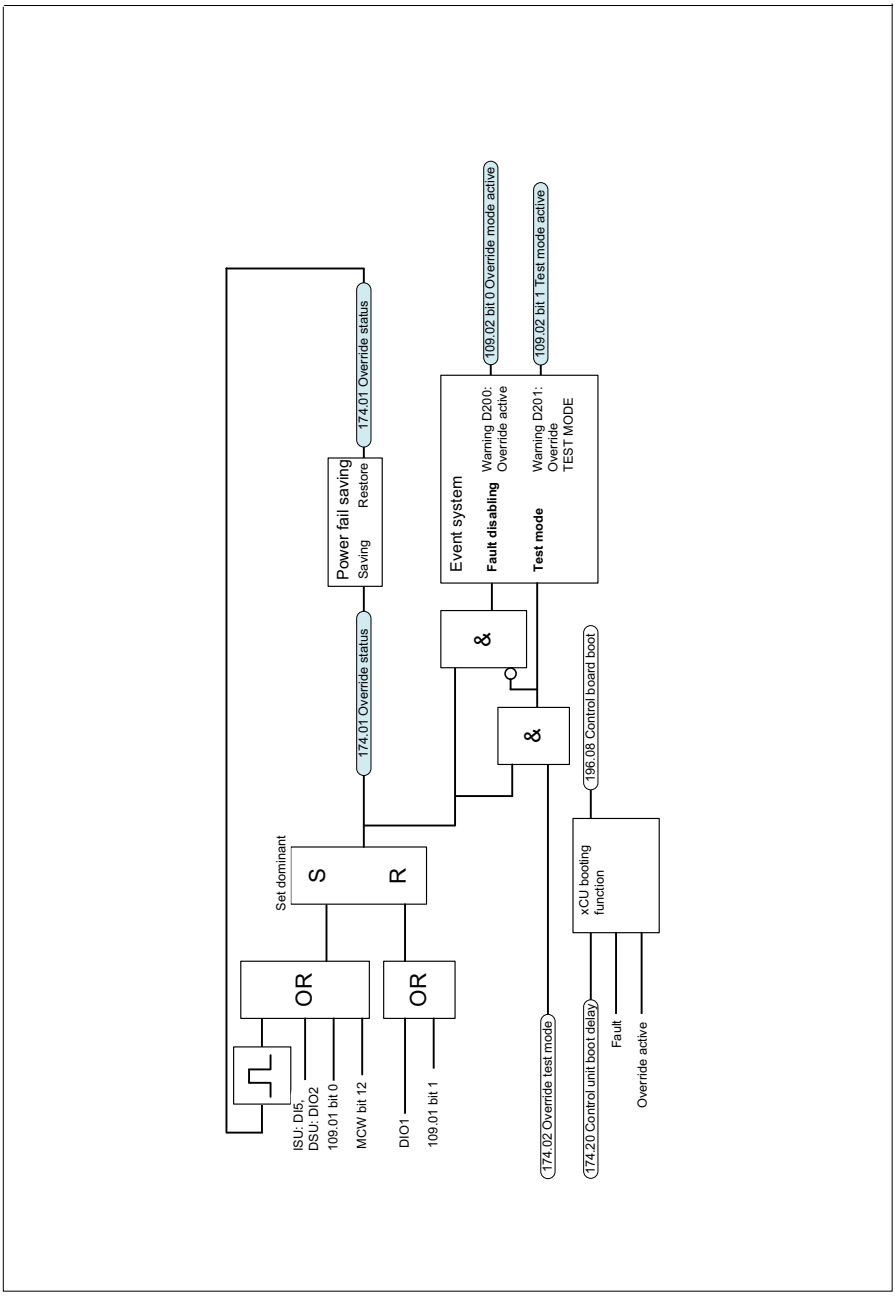
Override control chain program for INU



Current and switching frequency limitations



Override control chain program ISU and DSU



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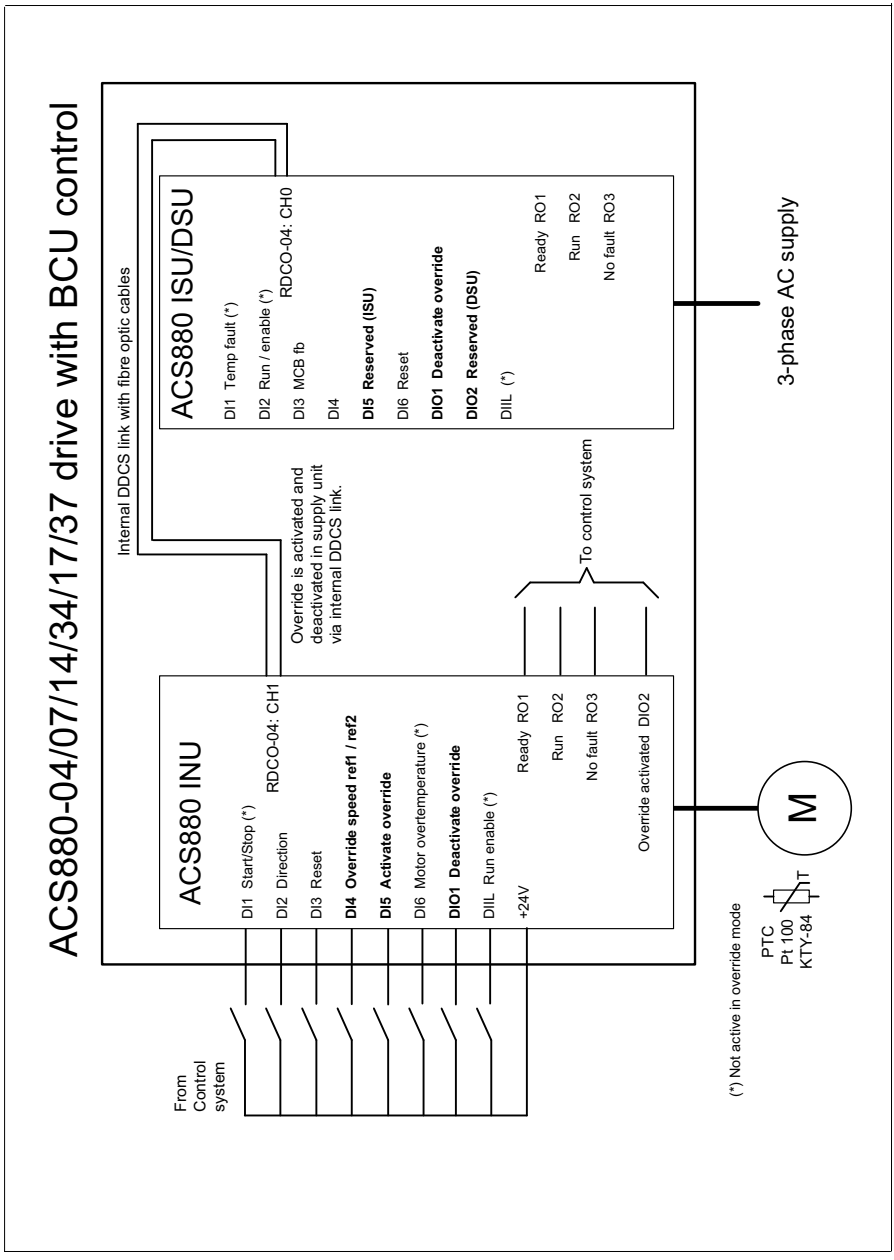
Example configurations

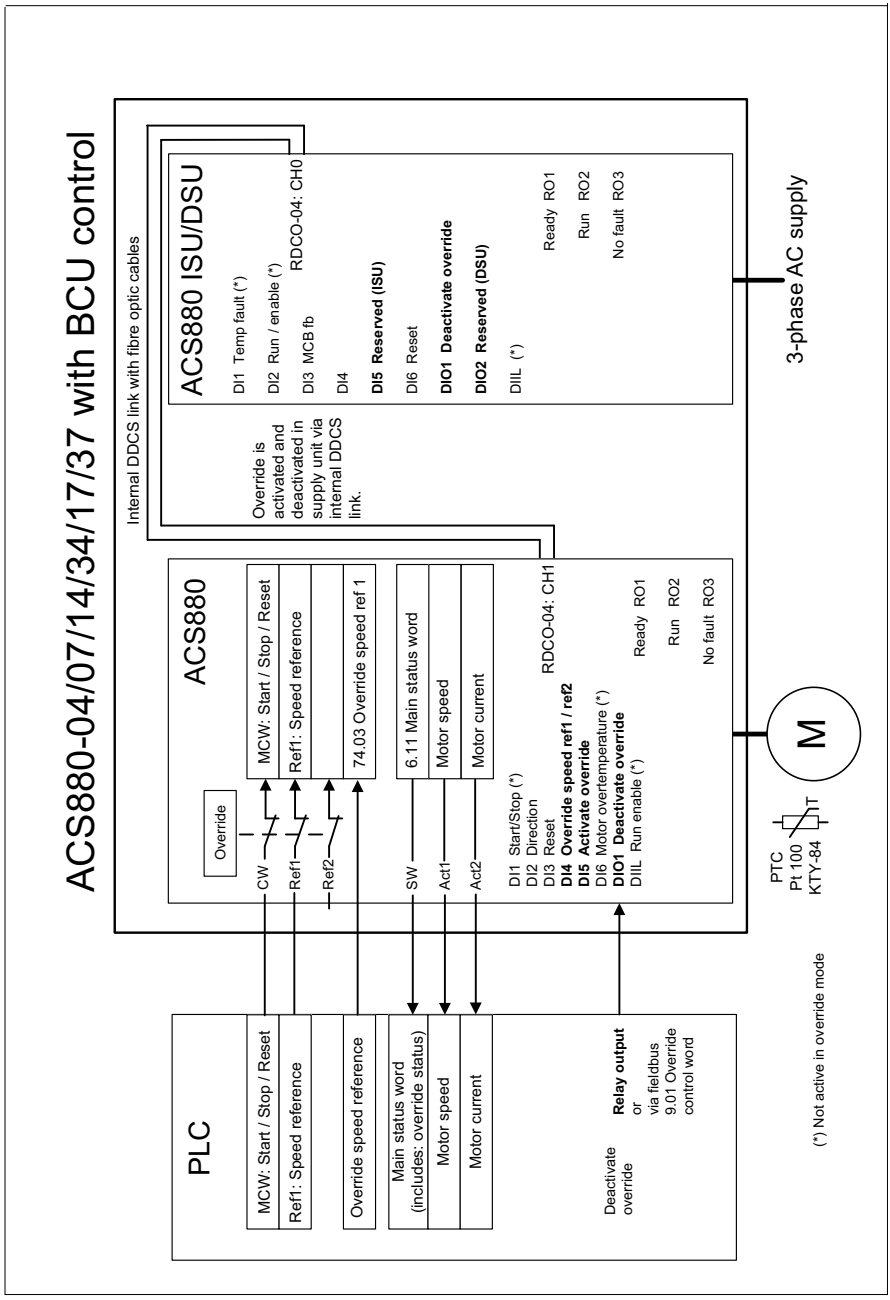
Contents of this chapter

This chapter presents the override control program IO control and fieldbus configurations.

Drive IO control



Drive fieldbus control



Further information

Product and service inquiries

Address any inquiries about the product to your local ABB representative, quoting the type designation and serial number of the unit in question. A listing of ABB sales, support and service contacts can be found by navigating to www.abb.com/searchchannels.

Product training

For information on ABB product training, navigate to new.abb.com/service/training.

Providing feedback on ABB manuals

Your comments on our manuals are welcome. Navigate to new.abb.com/drives/manuals-feedback-form.

Document library on the Internet

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