Technical Description

ABB low voltage drives
ACH550, Overide function

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Description of the function

When override is activated (via digital input):

The drive stops, loads the predefined override parameter set into use and then accelerates to the preset (or PID controlled) speed or frequency.

When override is active:

- If override reference is constant (P1707 = CONSTANT):
  - Drive runs at preset speed (frequency)
- or if the source for the override reference is PID1 output (P1707 = PID):
  - Drive runs at speed (frequency) defined by the PID1 controller
- Drive ignores all keypad commands
- Drive ignores all commands from communication links
- Drive ignores all digital inputs except DI1…DI6
  - when used for deactivation of override functionality, P1701 OVERRIDE SEL.
  - when used for controlling the motor rotation direction, P1706 OVERRIDE DIR.
  - when used as a source of the RUN ENABLE signal, P1601 RUN ENABLE.
  - when used as a source of the START ENABLE signals, P1608 START ENABLE 1 and P1609 START ENABLE 2.
- Drive ignores all analog inputs except AI1…AI2
  - When used for PID1 set point (P1707 OVERRIDE REF = PID)
- Drive displays alarm message "2020 OVERRIDE MODE"
- Drive handles the fault situations as described in the section "Fault handling in override mode"

When override is deactivated (via digital input):

The drive stops and reboots. If the start command, run enable and start enables are active in the AUTO mode, the drive starts automatically and continues normally after override mode. In the HAND mode the drive returns to OFF mode.

Commissioning of the override mode:

1. Enter values of all parameters as needed.
2. Select the digital input that will activate override mode , P1701 OVERRIDE SEL.
3. Select the source for the frequency or speed reference, P1707 OVERRIDE REF.
4. Select the digital input that will define the motor rotation direction or define the fixed direction, P1706 OVERRIDE REF.
5. Enter the frequency or speed reference for override mode, P1702 and P1703, according to the motor control mode P9904 (see note 1).
   Note: Frequency or speed reference has no effect if PID is used as a source of the reference (P1707 = PID).
6. Enter the pass code, P1704 OVERRIDE PASS CODE (pass code 358).
7. Enable the override mode, P1705 OVERRIDE ENABLE
8. Test the functionality of the override mode and make changes when necessary (see changing the override parameters).

Note 1: The following conditions must be met for avoiding parameterizationOverrSSpecific B error, fault code 1011.

- If the source for the override reference is PID1 output (P1707 OVERRIDE REF= PID):
  - PID1 set point (P4010) must be either AI1, AI2 or INTERNAL.
  - PID1 parameter set 1 must be active (P4027 = SET 1).
  - Override direction (P1706) must be either FORWARD (0) or REVERSE (7).
- If the override reference is constant (P1707 OVERRIDE REF= CONSTANT):
  - Frequency reference must be > 0 Hz, if motor control mode (P9904) is SCALAR.
  - Speed reference must be > 0 rpm, if the motor control mode (P9904) is VECTOR: SPEED.

Changing the override parameters:

1. If override mode is already enabled, disable it:
   - Enter the pass code P1704 OVERRIDE PASS CODE.
   - Disable the override mode P1705 OVERRIDE ENABLE.
2. Load the override parameter set, P1705 value 2 (LOAD).
3. Change the parameters as needed.
4. If needed, change the parameters in group 17:
   - Digital input for override mode, P1701.
   - Motor rotation direction, P1706.
   - Source of the reference, P1707.
   - Frequency or speed reference, P1702 or P1703, if PID is not used.
5. Enter the pass code P1704.
6. Enable the override mode P1705. The drive replaces the override parameter set with new values of all parameters and activates the override mode.

Code	Description	Range
1701	**OVERRIDE SEL** Selects the source of the override activation signal. 0 = NOT SEL. Override activation signal not selected. 1 = DI1 - Defines digital input DI1 as the override activation signal. • This digital input must be activated for override activation signal. 2…6 = DI2…DI6 - Defines digital input DI2…DI6 as the override activation signal. • See DI1 above. -1 = DI1(INV) - Defines an inverted digital input DI1 as the override activation signal. • This digital input must be de-activated for override activation signal. -2…-6 = DI2 (INV)…DI6(INV) - Defines an inverted digital input DI2…DI6 as the override activation signal. • See DI1 (INV) above.	**-6...6**
1702	**OVERRIDE FREQ** Defines a preset frequency for the override, if parameter 1707 = CONSTANT. The direction of rotation is defined by parameter 1706. **Note:** Set this value if motor control mode (parameter 9904) is SCALAR: FREQ (3).	**0…500 Hz**
1703	**OVERRIDE SPEED** Defines a preset speed for the override, if parameter 1707 = CONSTANT. The direction of rotation is defined by parameter 1706. **Note:** Set this value if motor control mode (parameter 9904) is VECTOR: SPEED (1).	**0…30.000 rpm**
1704	**OVERRIDE PASS CODE** Entering the correct pass code unlocks parameter 1705 for one change. • Enter the pass code always before changing the value of parameter 1705. • See parameter 1705 below. • The pass code is 358. • The entry reverts back to zero automatically.	**0…65535**
1705	**OVERRIDE ENABLE** Selects whether the override is enabled or disabled. 0 = OFF - Override disabled. 1 = ON - Override enabled. • When enabled, the drive stores the values of all parameters into an override parameter set and the parameters in group 17 will be write protected (except parameter 1704). To change other parameters in group 17, override has to be disabled. 2 = LOAD[1] - Loads the saved override set into use (as an active parameter set).	**0…2**
1706	**OVERRIDE DIR**[1] Defines the control of motor rotation direction in override mode. 0 = FORWARD. Rotation is fixed in the forward direction. 1 = DI1 - Defines the digital input DI1 as the motor rotation direction signal. • Digital input de-activated = motor rotation direction is FORWARD. • Digital input activated = motor rotation direction is REVERSE. 2…6 = DI2…DI6 - Defines digital inputs DI2…DI6 as the motor rotation direction signal. • See DI1 above. 7 = REVERSE. Rotation is fixed in the reverse direction. -1 = DI1(INV) - Defines an inverted digital input DI1 as the motor rotation direction signal. • Digital input activated = motor rotation direction is FORWARD. • Digital input de-activated = motor rotation direction is REVERSE. -2…-6 = DI2 (INV)…DI6(INV) - Defines an inverted digital input DI2…DI6 as the motor rotation direction signal • See DI1 (INV) above.	**-6…6**
1707	**OVERRIDE REF**[1] Defines the source of the frequency or speed reference for the override. 1 = CONSTANT - Frequency or speed reference is defined by parameter 1702 or 1703 respectively. 2 = PID - The speed / frequency reference is taken from PID1 output.	**1…2**

[1] Software firmware version v3.11a or later supports this parameter or selection of a parameter.

Handling of faults when override mode is active

Terms:

IGNORED: The fault is ignored while in override mode. The operation continues as before the fault condition. The relay outputs are not updated.

AUTOMATIC RESET: Drive performs a reset automatically and continuously once in every ten seconds. Note! The autoreseting functionality used in override mode is independent from settings in group 31 Automatic Reset. Parameters of group 31 are applied only in normal operation mode. The relay outputs are updated.

TRIP: The drive trips to fault and stops. The fault is not resettable. The relay outputs are updated.

AUTORESET/TRIP: Drive performs a reset automatically and continuously once in every ten seconds. E.g. in case of parameterization fault the autoreseting has no effect because parameter table is locked. AUTORESET/TRIP fault can not be fixed anymore in override mode and the result in behavior of the drive is the same as in TRIP case. The relay outputs are updated.

Fault code	Fault name in panel	Description and recommended corrective action	Possibility to mask fault in normal operation mode	Operation in case of fault while in HVAC override mode
1	OVERCURRENT	Output current is excessive. Check for and correct: • Excessive motor load. • Insufficient acceleration time (parameters 2202 ACCELER TIME1 and 2205 ACCELER TIME2). • Faulty motor, motor cables or connections.	NO	AUTOMATIC RESET
2	DC OVERVOLT	Intermediate circuit DC voltage is excessive. Check for and correct: • Static or transient over voltages in the input power supply. • Insufficient deceleration time (parameters 2203 DECELER TIME1 and 2206 DECELER TIME2). • Undersized brake chopper (if present).	NO	AUTOMATIC RESET
3	DEV OVERTEMP	Drive heat sink is overheated. Temperature is at or above 115°C (239°F). Check for and correct: • Fan failure. • Obstructions in the air flow. • Dirt or dust coating on the heat sink. • Excessive ambient temperature or motor load.	NO Yes (P10513, bit 0)	IGNORED

4	SHORT CIRC	Fault current. Check for and correct: • A short-circuit in the motor cable(s) or motor. • Supply disturbances.	NO	AUTOMATIC RESET
6	DC UNDERVOLT	Intermediate circuit DC voltage is not sufficient. Check for and correct: • Missing phase in the input power supply. • Blown fuse. • Undervoltage in mains.	NO	IGNORED
7	AI1 LOSS	Analog input 1 loss. Analog input value is less than AI1 FLT LIMIT(3021). Check for and correct: • Source and connection for analog input. • Parameter settings for AI1 FLT LIMIT (3021) and 3001 AI<MIN FUNCTION.	YES (P3001)	IGNORED
8	AI2 LOSS	Analog input 2 loss. Analog input value is less than AI2 FLT LIMIT(3022). Check for and correct: • Source and connection for analog input. • Parameter settings for AI2 FLT LIMIT (3022) and 3001 AI<MIN FUNCTION.	YES (P3001)	IGNORED
9	MOT OVERTEMP	Motor is too hot, as estimated by the drive. • Check for overloaded motor. • Adjust the parameters used for the estimate (3005…3009). • Check the temperature sensors and Group 35 parameters.	YES (P3005)	IGNORED
10	PANEL LOSS	Panel communication is lost and either: • Drive is in local control mode (the control panel displays HAND), or • Drive is in remote control mode (AUTO) and is parameterized to accept start/stop, direction or reference from the control panel. To correct check: • Communication lines and connections • Parameter 3002 PANEL COMM ERROR. • Parameters in Group 10: Command Inputs and Group 11: Reference Select (if drive operation is REM).	NO	IGNORED
11	ID RUN FAIL	The motor ID run was not completed successfully. Check for and correct: • Motor connections.	NO	AUTOMATIC RESET

12	MOTOR STALL	Motor or process stall. Motor is operating in the stall region. Check for and correct: • Excessive load. • Insufficient motor power. • Parameters 3010…3012.	YES (P3010)	IGNORED
14	EXT FAULT1	Digital input defined to report first external fault is active. See parameter 3003 EXTERNAL FAULT1.	YES (P3003)	IGNORED
15	EXT FAULT2	Digital input defined to report second external fault is active. See parameter 3004 EXTERNAL FAULT2.	YES (P3004)	IGNORED
16	EARTH FAULT	The load on the input power system is out of balance. • Check for/correct faults in the motor or motor cable. • Verify that motor cable does not exceed max. specified length.	YES (P3017)	AUTOMATIC RESET
17	UNDERLOAD	Motor load is lower than expected. Check for and correct: • Disconnected load. • Parameters 3013 UNDERLOAD FUNCTION…3015 UNDERLOAD CURVE.	YES (P3013)	IGNORED
18	THERM FAIL	Internal fault. The thermistor measuring the internal temperature of the drive is open or shorted. Contact your local ABB sales representative.	NO Yes (P10513, bit 1)	IGNORED
19	OPEX LINK	Internal fault. A communication-related problem has been detected between the OMIO and OINT boards. Contact your local ABB sales representative.	NO	AUTOMATIC RESET
20	OPEX PWR	Internal fault. Low voltage condition detected on the OINT board. Contact your local ABB sales representative.	NO	AUTOMATIC RESET
21	CURR MEAS	Internal fault. Current measurement is out of range. Contact your local ABB sales representative	NO Yes (P10513, bit 2)	IGNORED
22	SUPPLY PHASE	Ripple voltage in the DC link is too high. Check for and correct: • Missing mains phase. • Blown fuse.	NO Yes (P10513, bit 3)	IGNORED

24	OVERSPEED	Motor speed is greater than 120% of the larger (in magnitude) of 2001 MINIMUM SPEED or 2002 MAXIMUM SPEED. Check for and correct: • Parameter settings for 2001 and 2002. • Adequacy of motor braking torque. • Applicability of torque control. • Brake chopper and resistor.	NO Yes (P10513, bit 4)	IGNORED
26	DRIVE ID	Internal fault. Configuration file drive ID not valid.	NO	TRIP
27	CONFIG FILE	Internal fault. Configuration file has an error. Contact your local ABB sales representative	NO	TRIP
28	SERIAL1 ERR	Fieldbus communication has timed out. Check for and correct: • Fault setup (3018 COMM FAULT FUNC and 3019 COMM FAULT TIME). • Communication settings (Group 51 or 53 as appropriate). • Poor connections and/or noise on line.	YES (P3018)	IGNORED
29	EFB CON FILE	Error in reading the configuration file for the fieldbus adapter.	NO	IGNORED
30	FORCE TRIP	Fault trip forced by the fieldbus. See the fieldbus user's manual.	NO Yes (P10513, bit 5)	IGNORED
31	EFB1	Fault code reserved for the EFB protocol application. The meaning is protocol dependent.	NO Yes (P10513, bit 6)	IGNORED
32	EFB2	Fault code reserved for the EFB protocol application. The meaning is protocol dependent.	NO Yes (P10513, bit 7)	IGNORED
33	EFB3	Fault code reserved for the EFB protocol application. The meaning is protocol dependent.	NO Yes (P10513, bit 8)	IGNORED
34	MOTOR PHASE	Fault in the motor circuit. One of the motor phases is lost. Check for and correct: • Motor fault. • Motor cable fault. • Thermal relay fault (if used). • Internal fault.	NO Yes (P10513, bit 9)	IGNORED
35	OUTP WIRING	Error in power wiring suspected. Check for and correct: • Input power wired to drive output. • Ground faults.	NO	TRIP

36	INCOMPATIBLE SW	Loaded software is not compatible. Contact your local ABB sales representative and report the error number.	NO	TRIP
38	USER LOAD CURVE	Actual torque has been out of the user defined range for the specified time.	NO	TRIP
101	SYSTEM ERROR	Error internal to the drive. Contact your local ABB sales representative and report the error number.	NO	TRIP
103	SYSTEM ERROR		NO	TRIP
201	SYSTEM ERROR	Error in the system. Contact your local ABB sales representative and report the error number.	NO Yes (P10515, bit 0)	IGNORED
202	SYSTEM ERROR		NO Yes (P10515, bit 1)	IGNORED
203	SYSTEM ERROR		NO Yes (P10515, bit 2)	IGNORED
204	SYSTEM ERROR		NO	IGNORED
206	SYSTEM ERROR		NO	TRIP [1] [1] Not possible with firmware versions 200F or later.
207	SYSTEM ERROR		NO	IGNORED
1000	PAR HZRPM	Parameter values are inconsistent. Check for any of the following: • 2001 MINIMUM SPEED> 2002 MAXIMUM SPEED. • 2007 MINIMUM FREQ> 2008 MAXIMUM FREQ. • 2001 MINIMUM SPEED/ 9908 MOTOR NOM SPEED is outside of the range: -128…128. • 2002 MAXIMUM SPEED/ 9908 MOTOR NOM SPEED is outside of the range: -128…128. • 2007 MINIMUM FREQ/ 9907 MOTOR NOM FREQ is outside of the range: -128…128. • 2008 MAXIMUM FREQ/ 9907 MOTOR NOM FREQ is outside of the range: -128…128.	NO Yes (P10514, bit 0)	IGNORED

1001	PARPFC REFNG	Parameter values are inconsistent. Check for the following: • 2007 MINIMUM FREQ is negative, when 8123 PFA ENABLE is active.	NO Yes (P10514, bit 1)	IGNORED
1003	PAR AI SCALE	Parameter values are inconsistent. Check for any of the following: • 1301 AI1 MIN> 1302 AI1 MAX. • 1304 AI2 MIN> 1305 AI2 MAX.	NO Yes (P10514, bit 3)	IGNORED
1004	PAR AO SCALE	Parameter values are inconsistent. Check for any of the following: • 1504 AO1 MIN> 1505 AO1 MAX. • 1510 AO2 MIN> 1511 AO2 MAX.	NO Yes (P10514, bit 4)	IGNORED
1005	PAR PCU 2	Parameter values for power control are inconsistent: Improper motor nominal kVA or motor nominal power. Check for the following: 1.1 < (9906 MOTOR NOM CURR* 9905 MOTOR NOM VOLT* 1.73 / P_N) < 2.6 Where: P_N= 1000 * 9909 MOTOR NOM POWER (if units are kW) or P_N= 746 * 9909 MOTOR NOM POWER(if units are HP, e.g. in US)	NO Yes (P10514, bit 5)	AUTORESET/TRIP
1006	PAR EXT RO	Parameter values are inconsistent. Check for the following: • Extension relay module not connected and • 1410…1412 RELAY OUTPUTS4…6 have non-zero values.	NO Yes (P10514, bit 6)	IGNORED
1007	PAR FBUS	Parameter values are inconsistent. Check for and correct: • A parameter is set for fieldbus control (e.g. 1001 EXT1 COMMANDS= 10 (COMM)), but 9802 COMM PROT SEL= 0.	NO Yes (P10514, bit 7)	IGNORED
1008	PAR PFC MODE	Parameter values are inconsistent – 9904 MOTOR CTRL MODE must be = 3 (SCALAR SPEED), when 8123 PFA ENABLE is activated.	NO Yes (P10514, bit 8)	IGNORED
1009	PAR PCU 1	Parameter values for power control are inconsistent: Improper motor nominal frequency or speed. Check for both of the following: •1 < (60 * 9907 MOTOR NOM FREQ/ 9908 MOTOR NOM SPEED< 16 •0.8 < 9908 MOTOR NOM SPEED/ (120 * 9907 MOTOR NOM FREQ/ Motor poles) < 0.992	NO Yes (P10514, bit 9)	AUTORESET/TRIP

1010	PAR PFC & OVERRIDE	Override mode is enabled and PFA is activated at the same time. This can't be done because PFA interlocks cannot be observed in the override mode.	NO Yes (P10514, bit 10)	AUTORESET/TRIP
1011	PAR OVERRIDE	All override mode parameters do not have correct values when override mode is enabled.	NO Yes (P10514, bit 11)	N/A[2] [2] The enabling of override is not possible if fault occurs.
1012	PAR PFC IO 1	PFA parameterization fault: IO configuration is not complete, not enough relays parametrized for PFA. Conflict in grp 14, 8117 No Of Aux Mot and 8118 Autochng Level.	NO Yes (P10514, bit 2)	IGNORED
1013	PAR PFC IO 2	PFA parameterization fault: IO configuration is not complete, actual number of PFA motors (p8127) does not match to PFA motors in grp 14 and parameter 8118 Autochng Ival.	NO Yes (P10514, bit 12)	IGNORED
1014	PAR PFC IO 3	PFA parameterization fault: IO configuration is not complete, Can not allocate digital input (interlock) for each PFA motor (grp 14, 8118 Autochng Ival).	NO Yes (P10514, bit 13)	IGNORED
1016	PAR USER LOAD C	Parameterization error in the user defined load curve supervision: Frequencies f1-f5 are not in ascending order, or torque low limit is above high limit in some frequency point.	NO Yes (P10514, bit 15)	TRIP

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