

# Embedded Fieldbus Electrical Connection and Configuration

## Overview

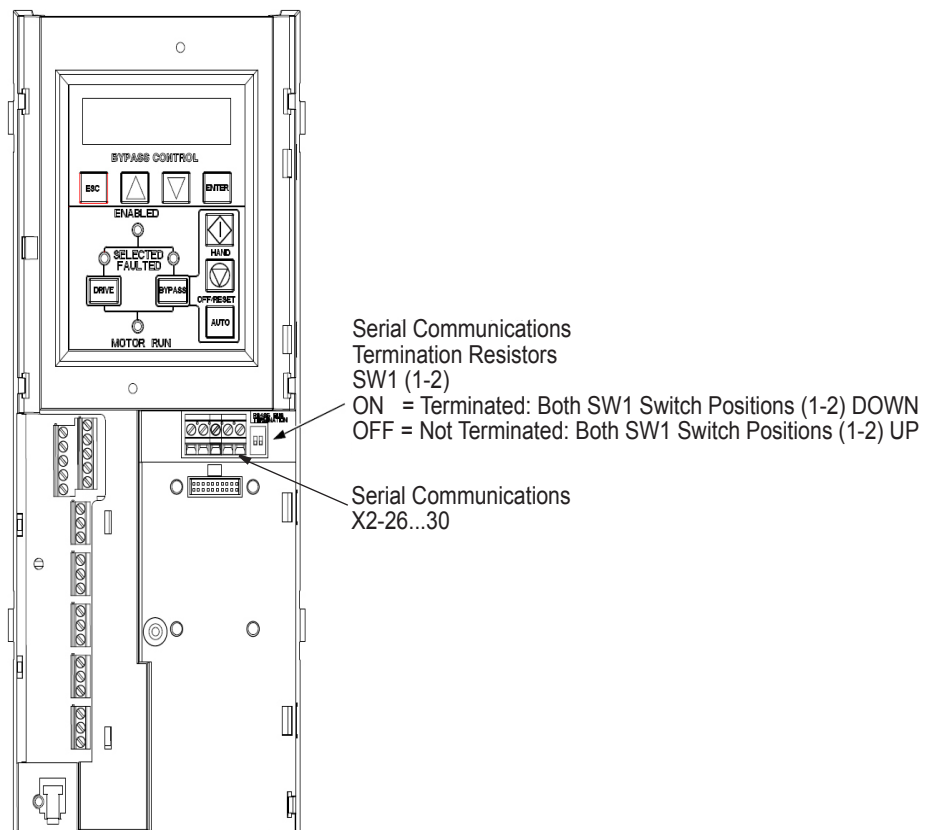
**Note!** The settings for ALL external serial communication between the ACH550 with E-Clipse Bypass and any Building Automation System are configured using the E-Clipse Bypass operator panel. DO NOT attempt to configure the external serial communication connection using the ACH550 operator panel!

The settings for internal communication between the ACH550 and the E-Clipse Bypass are configured at the factory and require no adjustment.

This document contains the basic start-up procedure of the E-Clipse Bypass Embedded Fieldbus protocols. The E-Clipse Bypass is embedded with BACnet, FLN, Modbus-RTU, and N2 protocols. For a complete list of parameters see Parameter Description section of the E-Clipse Bypass Configuration manual. E-Clipse Bypass parameter groups 14, 16, 17, 50, 53 and 98 can be changed for more specific network configuration. For protocol specific details for the EFB: BACnet, FLN, Modbus-RTU, and N2 download the ACH550 E-Clipse Bypass EFB User's Manual (3AUA0000031267 REVA) from [www.abb.us/drives](http://www.abb.us/drives).

## EFB Electrical Installation

The figure below shows the locations of the SW1 DIP switch and X2 terminals 26..30 on the E-Clipse Bypass control board. The function and setting of this switch and wire terminal connection are explained in the following section.

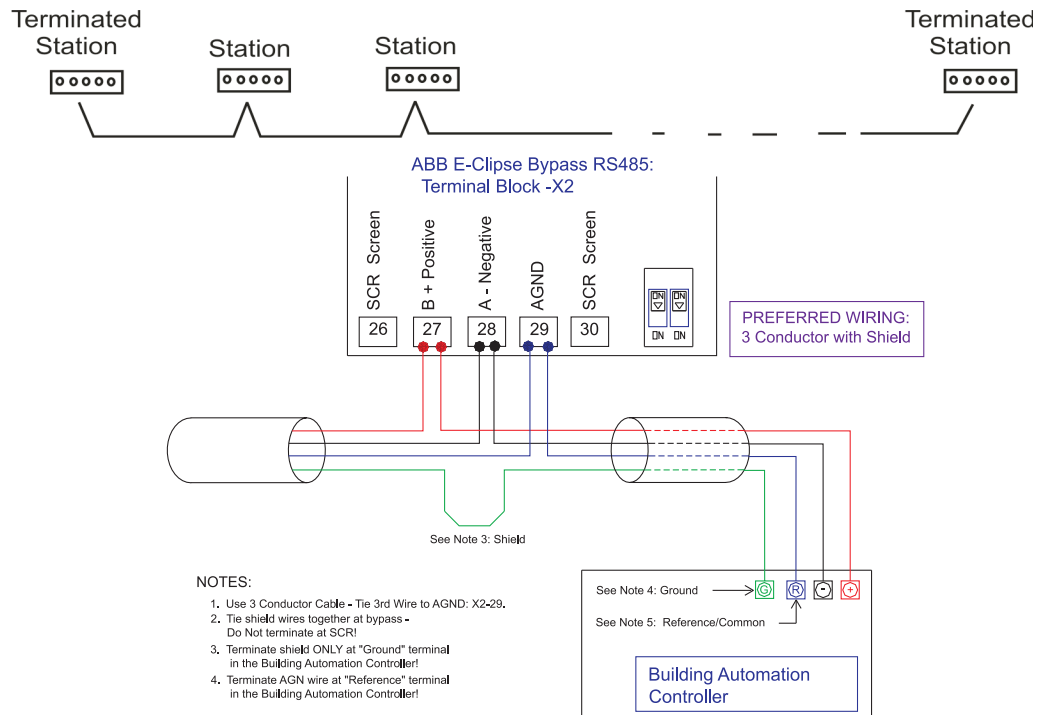


**Warning!** Connections should be made only while the bypass is disconnected from the power source.

Bypass terminals 26...30 are for EIA 485 communications.

- Use Belden 9842 or equivalent. Belden 9842 is a dual twisted, shielded pair cable with a wave impedance of 120  $\Omega$ .
- Use one of these twisted shielded pairs for the EIA 485 link. Use this pair to connect all A (-) terminals together and all B (+) terminals together.
- Use both of the other wires in the other pair for the logical ground (terminal 29)
- Do not directly ground the EIA 485 network at any point. Ground all devices on the network using their corresponding earthing terminals.
- As always, the grounding wires should not form any closed loops, and all the devices should be earthed to a common ground.
- Connect the EIA 485 link in a daisy-chained bus, without dropout lines.
- To reduce noise on the network, terminate the EIA 485 network using 120  $\Omega$  resistors at both ends of the network. Use the DIP switch to connect or disconnect the termination resistors. See following diagram and table.

Preferred Wiring Diagram (See ACH550 E-Clipse Bypass EFB User's Manual (3AUA0000031267 REVA) for Alternate Wiring:



- Do not connect the shield at the bypass. Tie the shields together at the bypass. Only load the shield connection at the EIA 485 master.
- Use separate, metal conduit and route wires separately to keep these three classes of wiring apart:
  - Input power wiring
  - Motor wiring
  - Control/communications wiring

# Addendum to ACH550 E-Clipse User's Manual - 3AUA0000016461 Rev B

## DIP Switch Settings SW1 (1-2)

The DIP switch is used to configure the serial communications termination resistors. To reduce noise on the serial communications network, terminate the EIA-485 network using 120 ohm resistors at both ends of the network. If the E-Clipse Bypass is the last node on the network, use the DIP switches to connect or disconnect the on-board termination resistors. Both SW1 switch positions (1,2) must be set in the ON or OFF position to correctly configure the termination resistors.

## EFB Basic Configuration

The ACH550 drive has been programmed at the factory! Do not use drive control panel to program communications unless specified.

Follow steps 1 thru 5 as needed based on your network control requirements. See E-Clipse Bypass Configuration manual (3AUA0000016461 REVB): Parameter Description section, for a complete list of parameters. E-Clipse Bypass parameter groups 14, 16, 17, 50, 53 and 98 can be changed for more specific network configuration.

Download E-Clipse Bypass Embedded Fieldbus User Manual from <http://www.abb.us/drives>

- STEP 1: Establishing bypass communication with building management system
- STEP 2: START/STOP control via serial communication controller
- STEP 3: Drive reference and/or PID setpoint via serial communication controller
- STEP 4: BACnet Set-up
- STEP 5: CYCLE POWER to the system: E-Clipse bypass and drive. (Required)

STEP 1: Establishing Bypass Communication

Bypass Parameter	DRIVE (PAR 1625 = 0)	SYSTEM DRV & BYPASS (PAR 1625 = 1)	Description
9802 Comm Prot Sel	Select Communication protocol (0 - 5)	Select Communication protocol (0 - 5)	0 = NOT SEL 1= STD MODBUS 2 = N2 3 = FLN 4 = EXT FBA 5 = BACNET
1625 Comm CTL	0* (Factory setting)	1	0 = DRIVE ONLY (Default) 1= SYSTEM (DRV & BP) Selects comm control mode. In drive only mode, control of bypass is not possible. When SYSTEM is selected both the bypass and drive can be controlled in selected protocol.
5301 DV PROT ID	READ ONLY	READ ONLY	Do not edit. Contains protocol identification and revision.
5302 DV MAC ID	Set desired drive network ID	Set Desired drive network ID	Default: 1: Default 128 in BACnet Sets the drives unique node address
5001 BP PROT ID	READ ONLY	READ ONLY	Do not edit. Contains protocol identification and revision.
5002 BP MAC ID	N/A	Set desired bypass network ID	Default: 2 Sets the bypass unique node address

Note:

\* If 1625 is set to 0 drive only, bypass control of the motor is from the hand button on the bypass keypad.

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## STEP 2: START/STOP Control via Serial Communication Controller

Bypass Parameter	DRIVE	SYSTEM DRV & BYPASS	Description
1601 START/ STOP	2	2	0 = NOT SEL 1 = DI1 2 = COMM Selects source for system start command

Note: See E-Clipse Bypass Configuration manual section Parameter Description for complete list of group 16 parameters and settings.

## STEP 3: Drive Reference and/or PID Setpoint via Serial Communication Controller

Drive Parameter	DRIVE	SYSTEM DRV & BYPASS	Description
1103 REF1 SELECT <b>DRIVE CONTROL PANEL</b>	8	8	Selects the signal source for external reference REF1 8 = COMM – Defines the fieldbus as the reference source.  SEE ACH550-01/02 User Manual for additional information
4010 SET POINT SEL <b>DRIVE CONTROL PANEL</b>	8	8	Defines the reference signal source for the PID controller. Parameter has no significance when the PID regulator is by-passed 8 = COMM – Fieldbus provides set point.  SEE ACH550-01/02 User Manual for additional information

## STEP 4: BACnet Setup

Bypass Parameter	DRIVE	SYSTEM DRV & BYPASS	Description
5311 DV PAR11 DRIVE ID	Set DRIVE BACnet device ID	Set DRIVE BACnet device ID	This parameter, together with 5317 sets the DRIVE BACnet device object instance ID
5317 DV PAR17 DRIVE ID	Set DRIVE BACnet device ID	Set DRIVE BACnet device ID	For DRIVE ID's > 65,535 the ID = 5311's value + (10,000 x 5317)
5011 BP PAR11 BYPASS ID	N/A	Set BYPASS BACnet device ID	This parameter, together with 5317 sets the BYPASS BACnet device object instance ID
5017 BP PAR17 BYPASS ID	N/A	Set BYPASS BACnet device ID	For BYPASS ID's > 65,535 the ID = 5311's value + (10,000 x 5317)

### REQUIRED

#### STEP 5: CYCLE POWER

ALLOW TIME FOR DC BUS TO DISCHARGE. This is required for serial communication changes to take effect.