CDP301-01

Installation & Start-up Manual

CDP-301 Drive panel

CDP301-01-US-04
EFFECTIVE 2/17/94
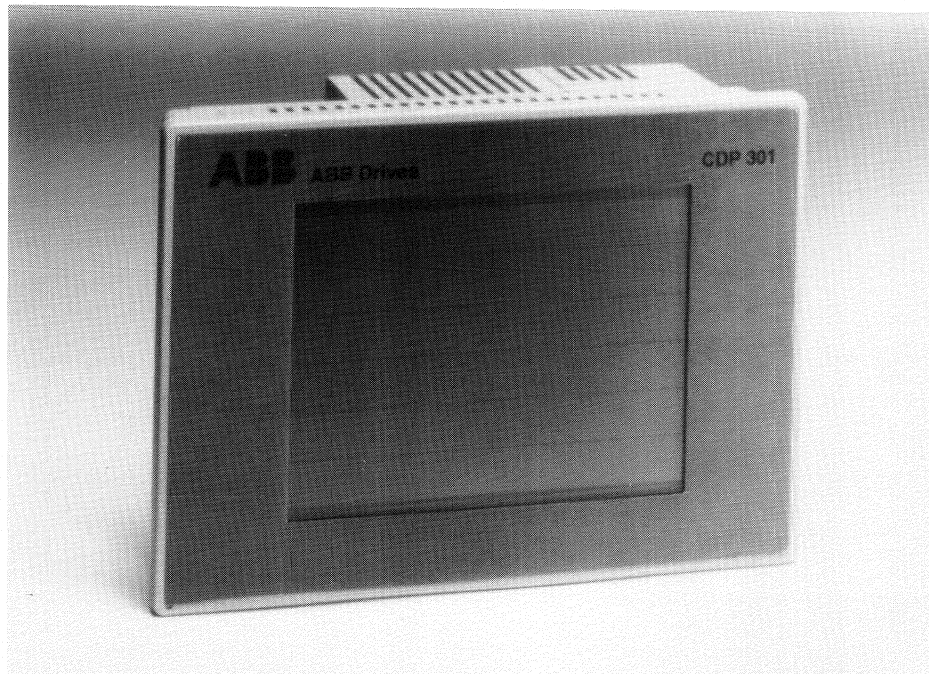
ABB Drives

ABB

CDP301-01
Remote touch screen panel
For ACS 500, ACH 500, Series B

Installation & Start-up Manual

CDP301-01-US-04

EFFECTIVE 2/17/94

General Safety Instructions

Warnings in this manual appear in either of two ways:

- *Dangerous voltage warnings*, preceded by a Dangerous Voltage symbol, indicate the presence of voltages which may cause death or serious injury. These warnings describe procedures to avoid death or serious injury.

- *General warnings*, preceded by a General Warning symbol, indicate situations or conditions which may cause death or serious injury. These warnings describe procedures to avoid death or serious injury.

CAUTIONS inform you of situations or conditions which will damage machinery or cause additional motor-operation down-time if you do not take suggested steps to correct or address such situations or conditions.

Note: Notes provide you with additional and useful information. Although less urgent than cautions and warnings, notes are important and should not be ignored.

Warning Symbols

For your own safety please pay special attention to instructions containing these symbols:

This warning symbol indicates the presence of dangerous voltage. This symbol informs you of high voltage conditions, situations, and locations that may cause death or serious injury if you do not follow precautions and proper steps.

This warning symbol indicates a general warning.

This warning symbol indicates an electrostatic discharge hazard.

Warnings, Cautions, and Notes

WARNING! Your drive contains dangerous voltages when connected to the line power. Always check that the ACS 501 is safe, after disconnecting the power, by measuring the DC bus voltage and line input voltage. Failure to check voltages could cause death or serious injury. Only a qualified electrician should carry out the electrical installation.

Note that the Motor Control Card of the ACS 501 is at DC bus voltage potential.

The DC bus capacitors contain dangerous DC voltage levels ($1.35 \times V_{IN}$). After disconnecting the supply, wait at least five minutes after the display readout on the control panel has disappeared before taking any measurements.

Dangerous external control voltages may be present on the relay outputs of the Control Interface Card and Option Cards.

CAUTION: Electrostatic Discharge (ESD) can damage electronic circuits. Do not handle any components without following the proper ESD precautions.

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Index

This chapter describes the purpose and contents of this manual, describes the intended audience, explains conventions used in this manual, and lists related publications.

How To Use This Manual

The purpose of this manual is to provide you with the information necessary to install, start-up, and program the touch-screen operated remote drive panel.

Chapter 1 – Introduction the chapter you are reading now, introduces you to the contents of this manual, and to the conventions being used through out the manual.

Chapter 2 – Technical Data gives technical information about the operator panel.

Chapter 3 – Installation gives instructions of how to install the panel, how to connect the panel to the drives, and what setups are required to be done on the drives.

Chapter 4 – Operation guides through of how to use the panel with the drives.

Chapter 5 – Trouble Shooting gives entry level diagnostics for finding out the causes and corrections to the most typical communication problems.

Intended Audience

The audience for this manual has:

- Knowledge of standard electrical wiring practices, electronic components, and electrical schematic symbols.

- Minimal knowledge of ABB product names and terminology.

- Previous experience in installing, operating, and programming the ACS 500 or ACH 500 drives.

The audience for this manual will install, start-up, and diagnose the touch screen panels. The audience will also program the ACS 500 drives for the serial communication network.

Conventions Used In This Manual

Listed below are some terms used in this manual. These terms are defined here to help you understand their meanings and applications throughout this manual. A more complete list of conventions used for the ACS 500 drives is in the Installation manual for the ACS 500.

Parameter

A parameter is a sub-set of a Group, selected through the Control Panel keys. Parameters in this manual often are expressed as a number, a decimal (.), another number, a decimal, and another number. The first number at the left represents the Main. The number between the decimals represents the Group, for example, 20.2 (Start/Stop). The number at the right represents a Parameter within that group, for example, 4 (Brake Chopper).

In this manual, Parameter 4 in Group 20.2 is expressed as Parameter 20.2.4.

RS-485

RS-485 is a standard electrical communication interface. This standard specifies the physical interface and voltages for serial communication network. The RS-485 does not specify what kind of protocol is being used on the network. Modbus and CDI-300 are two examples of many possible protocols that can use the physical RS-485 link.

Terminal Block

A terminal block is a group of wire connections on a drive. This manual expresses specific terminal blocks and connections as a letter, usually X, a number, a colon (:), and another number. The letter and number to the left of the colon represent the name of the terminal block, for example, X25. The number to the right of the colon represents the terminal connection, for example 16, on the terminal block. In this manual, a terminal connection numbered 16, located on a terminal block named X25, is expressed as X25:16.

Warranty and Liability Information

The warranty for your ABB drive covers manufacturing defects. The manufacturer carries no responsibility for damage due to transport or unpacking.

In no event and under no circumstances shall the manufacturer be liable for damages and failures due to misuse, abuse, improper installation, or abnormal conditions of temperature, dust, or corrosives, or failures due to operation above rated capacities. Nor shall the manufacturer ever be liable for consequential and incidental damages.

The period of manufacturer's warranty is 12 months, and not more than 18 months, from the date of delivery.

Extended warranty may be available with certified start-up. Contact your local distributor for details.

Your local ABB Drives company or distributor may have a different warranty period, which is specified in their sales terms, conditions, and warranty terms.

If you have any questions concerning your ABB drive, contact your local distributor or ABB Drives office.

The technical data and specifications are valid at the time of printing. ABB reserves the right to subsequent alterations.

Related Publications

For related information about the drive, refer to the ABB *ACS 500 Adjustable Frequency AC Drives 2 to 350 HP Programming Manual Including Application Macros (ACS 500-05)* and the *ACS 501 with Option Pack Users Manual (ACS 500-08)*. For the information about the CDI 300 network, refer to the ABB *CDI 300 Installation and Start-up Manual*.

This chapter describes the technical information about the CDP 301 touch screen operated remote drive panel.

Hardware Description

The CDP 301 panel is a flat backlit monochrome LCD terminal. The front of the panel is a discrete resistive touch screen with the NEMA 12 rating.

Specifications

The following specifications apply to the different ports on the device, as well as to the mechanical and environmental specifications for the panel.

Display..320 x 240 pixel passive LCD

Display size ....5" diagonal

Real time clock...Data and time, battery backed up

Touch screen..Discrete resistive

The rating for the front of the panel ....NEMA 12

Back light ....Cold cathode florescent backlight

Input voltage...24 VDC regulated

Input Power ....less than 12 W

Serial interface...Direct RS-485 port

Serial protocol ....CDI 300

Drive connection .... 1 to 10 ACS500 or ACH 500
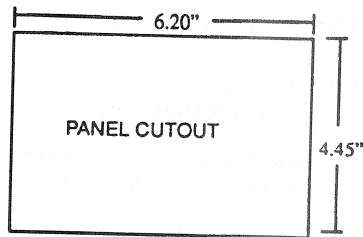
Dimensions

The dimensions for the CDP 301 panel are shown below in *Figure 2-1*.

Figure 2-1   Panel dimensions
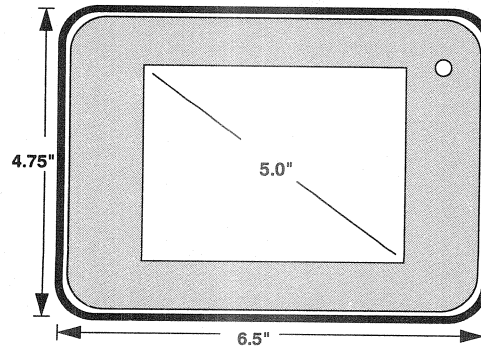
The panel is mounted into a rectangular cutout, whose dimensions are shown in *Figure 2-2*.
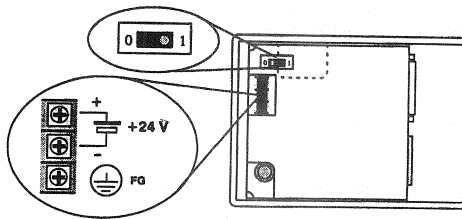
Figure 2-2   Cutout dimensions

Mounting

Power connection   The power is connected to the panel from an external 24 VDC power supply. There is a screw terminal for the DC power in the back of the panel, with a grounding terminal. The panel has a built-in power switch, which is located at the back of the unit. See *Figure 2-3*.
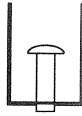
Figure 2-3   DC power terminal

Mounting brackets

The panel is mounted to the cutout using the mounting brackets provided with the panel. There are 4 mounting brackets, each one corresponding to each corner of the product.

To mount the product, place the screws to the brackets as in the diagram *Figure 2-4*.

Figure 2-4 Mounting screws

Then place the unit into the cutout, and place the brackets into their respective positions in the corners of the unit. Tighten the unit to the front using the screws.

Serial interface

The unit has a built in RS-485 port show in *Figure 2-5*. This port is located in the back of the unit, and it has a 25 pin female D-shell connector. ABB Drives is recommending the use of the serial interface cable provided with the panel to do the connection. If there is a need for an another cable, the cable should be connected accordingly to the diagram in *Figure 2-6*.

Figure 2-5 Serial interface connector

MAIN SERIAL
INTERFACE

Pin 1

AUX SERIAL INTERFACE   EXPANSION CONNECTOR
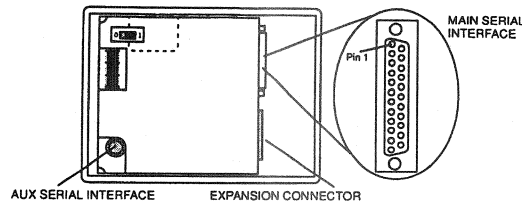
Figure 2-6 Serial cable connections

25 pin male   X51 on ACS

4			
5			
7	Ground		3
10	RS-485 +		4
11			5
15	RS-485 -		6
16			7
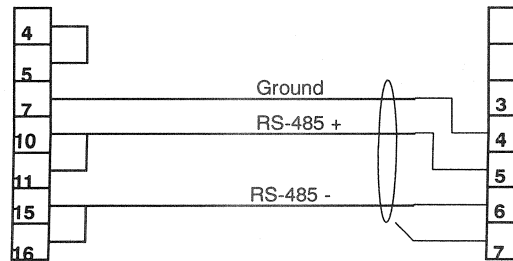
The ground wiring is to be connected to terminal block X51 in the drive. Ground wire goes to the X51:4, RS-485+ goes to X51:5, and RS-485- goes to X51:6.

Shield connection, and the cabling between the drives is described in the *CDI 300 Installation and Start-up Manual.*

If the distance from the panel to the first drive is longer than the cable length of the included serial cable, the cable can be extended using a 120Ω twisted shielded pair cable, like Belden 9844.

This chapter describes the installation procedures for the CDP 301 touch screen operated remote drive panel.

Panel installation

The whole application for the panel is stored in a non-volatile Flash-prom memory in the panel. There is no need for any software setups for the panel.

The panel installation typically requires the following steps:

- Mount the panel into the cut-out, and install the power supply to the panel.
- Connect the panel to the drives, and daisy chain the drives together for the serial interface.
- Install, if necessary, the CDI 300 EPROM in the drives
- Remove the grounding wire from terminal block X50:8 if installed. The terminal block X50 is the main terminal block on the bottom of the drive control board.
- Program the drives for the panel operation.

Both drive parameters and the serial interface connection must be completed for correct panel operation.

Mounting

The panel is installed into a cutout in a front plate using the four mounting brackets provided with the panel. The panel is secured to the panel by tightening the screws on the brackets.

Hardware setup

The drive requires some hardware upgrades and setups for it to work properly with the remote panel. This included grounding, serial communication cabling, and the drive firmware upgrade installation.

Ground wire

The grounding wire from the control interface board to the ground must be removed to reduce electrical noise on the drive. This is the green/yellow wire from terminal block X50:8 to the grounding screw.

Serial connection

The serial interface cable is connected to the 25-pin D-shell connector in the back. This cable needs to be connected to the drives using a twisted shielded pair cable like Belden 9844.

The panel is connected using three wires to the first drive. These wires correspond to Ground, RS-485+, and RS-485- signals. These wires are then daisy chained to the following drives using similar twisted shielded pair cable.

In an installation two drives need to be terminated. These drives should be the first and the last ones on the daisy-chained network. The panel does not have a termination resistor, so if the panel is the end station, the termination resistor needs to be installed on the first drive from the panel. The network must be

properly terminated to reduce electrical interference on the network. See *Figure 3-1*.

The termination resistor for the drive can be connected and disconnected on the drive using the jumpers S3 and S4. Both of these resistors must be in the same position, terminated or not. Both of these jumpers are located on the control board of the drive.

Figure 3-1 Termination for the network
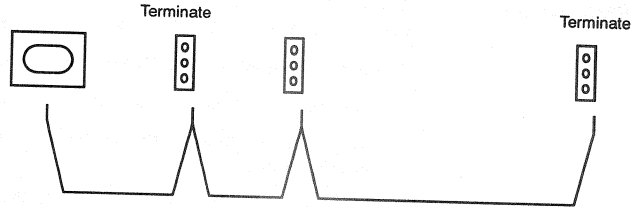
EPROM update

In order for the panel to operate properly the drives need to be updated to CDI 300 protocol. This update requires that the firmware EPROM on the control interface board be replaced with the optional EPROM containing the CDI 300 protocol.

No work should be done on the control interface board without disconnecting all the electrical power coming to the drive. Failure to check voltages can cause death, serious injury, or damage the drive.

While mounting the EPROM, check that the EPROM is mounted correctly into its socket. Verify that the small hole on the EPROM is on the same side as on the original EPROM before removal.

Electrostatic Discharge (ESD) can damage electronic circuits. Do not handle any component without following the proper ESD precautions.

Drive programming

The drives need to be programmed properly for the panel. In addition to the drive setups, there is a need for doing the serial interface connection properly.

Drive setup

The CDI 300 network is a masterless, multidrop protocol. Each one of the drives have a set of parameters which identify them on the network, and which are used to setup the operation of the drive on this network. These parameters need to be setup according to the guidelines presented in *Table 3-1*.

To program the drives, the following steps should be followed:

- Ensure power is removed from the drive.

- Change the EPROM if necessary, then power up the drive. If a fault occurs (PAR REST), power the drive down and up again to clear the fault.

- Load the factory macro to the drive. The way the factory macro can be loaded is described in *Programming Manual Including Application Macros* in Chapter 3.

- Setup the parameters presented in *Table 3-1*.

- Power the drive down, after the programming of the parameters is completed.

Table 3-1   Common Drive Setup

Parameter	Name	Setup value
9	Control location	External
10.1.1	Ext 1 Strt/Stp/Dir	STD COMM
10.2.2	External Ref1 Sel	STD COMM
10.4.2	Fault Reset Select	STD COMM
10.8.3	Control Source	31
10.8.4	Comms Fault Funct	None / Fault / Fault+Stop
10.8.8	Dataset 1 W Cycle	1000 ms
10.8.9	Dataset 1.1 Write	5/01/01
10.8.10	Dataset 1.2 Write	0/00/01
10.8.11	Dataset 1.3 Write	0/00/04

In addition to the common drive setup, there are some parameters which need to have an unique value for each one of the drives. These are described in *Table 3-2* and *Table 3-2*. In order to do this programming, each one of the drives must have a unique number in the range of 0 to 9. 0 must be selected for one drive. Per each one of the drive numbers, the following setups are unique.

Table 3-2   Individual drive setups

Parameter	Name	Setup value				
10.8.1	Drive Id-Number	0	1	2	3	4
10.8.7	Dataset 1 Writ Id	10	11	12	13	14
10.8.27	Dataset 1 Read	1	1	1	1	2
10.8.28	Dataset 1.1 Read	A	x	x	x	A
10.8.29	Dataset 1.2 Read	B	x	x	x	B
10.8.30	Dataset 1.3 Read	x	A	x	x	x
10.8.31	Dataset 1.4 Read	x	B	x	x	x
10.8.32	Dataset 1.5 Read	x	x	A	x	x
10.8.33	Dataset 1.6 Read	x	x	B	x	x
10.8.34	Dataset 1.7 Read	x	x	x	A	x
10.8.35	Dataset 1.8 Read	x	x	x	B	x

Table 3-3   Individual drive setups

Parameter	Name	Setup value				
10.8.1	Drive Id-Number	5	6	7	8	9
10.8.7	Dataset 1 Writ Id	15	16	17	18	19
10.8.27	Dataset 1 Read	2	2	2	3	3
10.8.28	Dataset 1.1 Read	x	x	x	**A**	x
10.8.29	Dataset 1.2 Read	x	x	x	**B**	x
10.8.30	Dataset 1.3 Read	**A**	x	x	x	**A**
10.8.31	Dataset 1.4 Read	**B**	x	x	x	**B**
10.8.32	Dataset 1.5 Read	x	**A**	x	x	x
10.8.33	Dataset 1.6 Read	x	**B**	x	x	x
10.8.34	Dataset 1.7 Read	x	x	**A**	x	x
10.8.35	Dataset 1.8 Read	x	x	**B**	x	x

In the *Table 3-2* and *Table 3-2* the following codes are used for:

Table 3-4   Coding

Code	Setup
A	CMD WORD
B	EXT REF1
x	NOT SEL

After programming the drives, the drives need to be powered down before all the changes will take effect.

This chapter describes the operation and use of the CDP 301 panels. The panels are touch screen operated graphical displays, so all the user action is done through selecting and pressing corresponding areas in the panel.

Panel layout

The panel has several independent graphical display screens. The following chapters will go through the details of each one. As a summary, there are the following screens in the panel:

*   Power up screen identifying the software version

*   Overview screen

*   Frequency and load bar chart screens

*   Drive details screens for each one of the drives

*   Reference setup screen

Power up Screen

After the unit has completed its power-up diagnostics, the power up identification screen is shown. The screen shows the current date and time, and the version identification for the panel like CDP301-01 in *Figure 4-1*.

Figure 4-1   Power up Screen
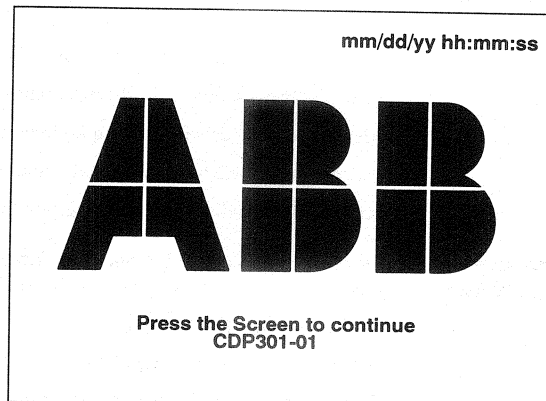
To leave the screen, touch the panel anywhere on the screen. There is no way to get back to the power up screen, except by turning the power off to the panel.

Overview Screen   The overview screen has two functions. It gives a fast overview of all the drives connected to the panel, and it also is used for the main selection menu to select other more detailed screens. An overview of the screen is shown in *Figure 4-2*.

Figure 4-2   Drive overview screen

Ok Stop 0	Ok Run 1	Fault Stop 2
0 % 0.00 Hz	24 % 34.50 Hz	0 % 0.00 Hz
Ok Run 3	Fault Stop 4	Ok Stop 5
24 % 34.50 Hz	0 % 0.00 Hz	0 % 0.00 Hz
Fault Stop 6	Ok Stop 7	Ok Run 8
0 % 0.00 Hz	0 % 0.00 Hz	24 % 34.50 Hz
Ok Stop 9		
0 % 0.00 Hz		Frequency Bars
Setup Reference	Set Clock	Load Bars

All the rectangles on this screen are used to activate some other screen.

Drive information   The top most 10 rectangles are showing information about one drive in the network. The rectangle has the following four fields:

* Ok / Fault shows whether the drive is faulted or not

* Run / Stop shows if the drive currently running or not

* nn % shows the drive load (torque) in percentage

* nn.nn Hz shows the drive actual output frequency in Hertz

To see the drive details, press the corresponding rectangle on the screen.

Common screen selection   The four rectangles on the bottom of the screen are used to select one of the common display screens for all of the drives. These screens include:
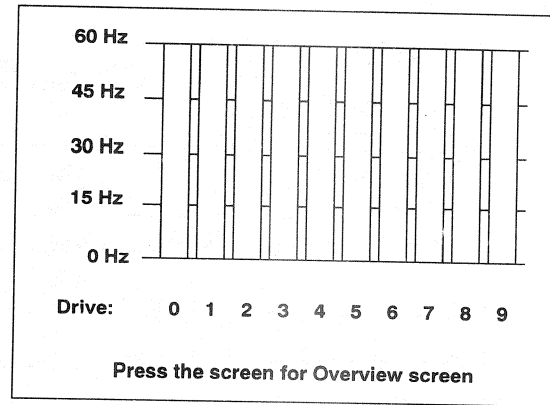
* Reference setup for the drives

* Adjustment of the real time clock

* Display of the drive loads in bar chart format

* Display of the actual drive frequencies in bar chart format

To select any of these screens, simply press the corresponding rectangle.

Frequency Bar Screen   The frequency bar display shows an overview of all the actual operating frequencies of all the drives connected into the panel. Drive number zero is the left most drive, and drive number nine is the right most bar.

Figure 4-3   Frequency bar display

```
60 Hz ┌──────────────────────────────
      │ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │
45 Hz ─┤ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │
      │ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │
30 Hz ─┤ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │
      │ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │
15 Hz ─┤ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │
      │ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │ │
 0 Hz └──────────────────────────────

Drive:   0  1  2  3  4  5  6  7  8  9

     Press the screen for Overview screen
```

To return to the overview screen, press anywhere on the screen.

Load Bar Screen

The load bar overview is similar to the frequency bar overview. In addition to the load display in bar chart format, the actual load (torque %) is also shown as a number below the bar.

Reference Setup Screen   The Reference setup screen is used to change the frequency reference value for all of the drives. The changing is done by first selecting the drive using the arrow keys, and then by entering a new value using the keypad on the left side of the screen.

Figure 4-4   Reference setup

This display has multiple individual areas.

- The drive is selected using the arrow keys. The selected drive is in between the up and down arrows.

    - The selected drive is indicated by a highlighted rectangle.

    - Down arrow moves the drive selection down by one row, while the Up arrow moves the drive selection up by one row.

    - Right arrow selects between the two columns.

- The start and stop keys can be used to start and stop the selected drive.

- The drive frequency references are shown for every drive in the ten numbers on the right.

- The frequency reference can be changed by using the keypad on the left.

    - Number keys will enter the number

    - **CE** key can be used to remove incorrectly entered digit.

    - **Ent** key is used to enter the frequency reference to the drive.

Example: For 60 Hz enter 60.00, not 60.

Set Clock   The real time clock can be set to the correct time using the Set Clock screen. The correct time is entered using the touch screen keypad. The time is entered as years [0 - 99], months [1 - 12], the day of the month [1 - 31], hours [0 - 23], minutes [0 - 59], and seconds [0 - 59].

The field is selected using the Up and Down keys. From this screen it is possible to get back to the Overview screen by pressing the Overview button.

Drive Details Screen   The drive details screen gives a detailed overview and control capabilities from one drive. There is one screen for each one of the drives connected to the panel.

To get to the detailed screen, press the corresponding rectangle for the drive on the overview screen.

Figure 4-5   Drive details

This screen has the following displays:

- `Freq n.nn Hz n.nn Hz` shows the actual and reference frequency for the drive

- `Load n %` shows the drive load (torque) in percentage

- `nnn kWh` shows the total cumulative kilowatt-hour counter from the drive

- Drive status contains the following fields:

    - `- - - / Ready` shows if the drive is ready to be started.

    - `Run / Stop` shows whether the drive is running.

    - `Fault / Ok` shows if the drive is presently faulted.

- Fault queue shows the contents of the whole fault queue in the drive, with the latest fault on the top

    - The top most line shows the latest fault, or the text `- No Fault -` if the queue is cleared

    - The two following entries show the text `- See Panel -` if there is a fault or `- No Fault -` if the fault queue is cleared. To see the actual drive fault, there is a need to go directly to the drive.

This screen has the following buttons:

- Start button will start the drive with ramp

- Stop button will stop the drive using ramp

- Stop by Coast will stop the drive immediately without the ramp. To do this, the button must be held down until the drive has actually started to stop.

- Reset Fault button will reset a drive fault from the drive.

- Setup Reference button will change the screen to the common Reference Setup screen.

- Overview button will change the screen to the common Overview screen.

- The framed fault queue is actually one button. If this is pressed the very latest fault queue entry is cleared.

This chapter describes the trouble shooting procedures for diagnosing installation or run-time problems, and their possible corrections.

For other general fault diagnostics with the ACS 500 or ACH 500 drives consult the appropriate product manual. For detailed description of the CDI 300 network troubleshooting consult the *CDI 300 Installation & Start-up Manual.*

CDI 300 Network

The network problems can be caused by multiple sources. Some of these include:

- Loose connections
- Incorrect wiring, including swapped wires
- Bad grounding
- Duplicate station numbers
- Duplicate dataset numbers
- Incorrect programming and setup for drives or other devices on the network.

The major diagnostic features for fault tracing on the network include Group 10.8 External Communication parameters 5 BAD MESSAGE COUNTER and 6 GOOD MESS COUNTER.

This chapter will list some possible communication problems, how to identify them, and will list some possible corrections.

Normal operation

During normal operation of the network, the GOOD MESS COUNTER should be constantly advancing on all the stations, and the BAD MESSAGE COUNTER should advance very slowly, if at all.

The BAD MESSAGE COUNTER will advance whenever there is a bad character received, and the GOOD MESS COUNTER will advance for each good character received.

No Bus Administrator on line

How to diagnose: The GOOD MESS COUNTER nor the BAD MESSAGE COUNTER does not increase on any of the stations.

How to correct: Check that one of the stations on line is programmed to be station zero. Verify that the BA has power connected to it. Verify that the cable is connected, and is not cut or short circuited.

Duplicate station

How to diagnose: Datasets being transmitted from one station are not received by any of the stations. The BAD MESSAGE COUNTER is advancing slowly.

How to correct: Verify from all the stations all the station numbers. Change conflicting station numbers.

Duplicate dataset number

How to diagnose: The dataset being transmitted either never comes, or its data is random. The BAD MESSAGE COUNTER is advancing.

How to fix: Check all the dataset numbers from all of the stations. Change the conflicting dataset numbers.

No communication

How to diagnose: The GOOD MESS COUNTER and the BAD MESSAGE COUNTER do not advance on any of the drives.

How to correct: Verify that one of the drives is programmed as the station zero. Verify that this drive is both powered up, and is connected to the network. The CDI 300 link requires that the station number zero is on-line and powered.

Improper grounding

How to diagnose: The BAD MESSAGE COUNTER is advancing. If the drives are turned on, the BAD MESSAGE COUNTER advances faster.

There might also be a CON INT, IN COMMS, or MOT CONT faults coming randomly.

How to fix: Check the wiring, shield connections, and grounding. See that no noise is brought to the drive through analog or digital inputs or outputs. Verify that the grounding wire from screw 8 on terminal block X50 is removed.

Swapped wires

How to diagnose: The GOOD MESS COUNTER is not advancing. The BAD MESSAGE COUNTER is advancing.

How to fix: Check that the RS-485 line wires are not swapped. Verify that the control boards are connected together using the wire on screw 4 on the serial communication terminal block.

Drive setup

All the drives need to be programmed properly to receive and send information between the drives and the panel. The panel configuration is fixed, so if a drive is not setup properly, the panel communication will not work fully.

Typically if a parameter is not programmed correctly, some of the following problems might occur:

*   Some of the information is not updated, or has an incorrect value compared to the local drive panel.

*   Some of the drives do not follow either the start or stop commands, or the frequency reference cannot be modified.

In these cases check group 10.8 EXT COMMUNICATION settings for the drive which has a data transfer problem.

Back light

The panel has a low temperature fluorescent back light. This light has a limited lifetime. In normal use, the built-in screen saver will turn the back light off when the panel is not in use, thus extending the lifetime for the light.

If the back light is burned out, the panel will remain blank, but the green Power On light will be on. In this case the back light unit needs to be replaced.

Summary

The problems described here cover the most usual problems on starting up the CDI 300 network. Intermittent problems might well be caused by marginally loose connections, vibration caused wear on wires, or especially through insufficient grounding and shielding on both the devices and on the communication cables.

If after basic troubleshooting, the problem continues, contact ABB technical support (800) 243 4384.

ABB