Drive Faceplates for the CP600 HMI

US Quick installation guide

List of related manuals

HMI manuals and guides	Code (English)
Panel Builder 600 Software Manual	*3ADR010277*
CP6407, CP6410, CP6415	
Operating instructions	*3ADR010470*
Installation instructions	*3ADR010451*
CP6605, CP6607, CP6410, CP6415, CP6621	
Operating instructions	*3ADR010108*
Installation instructions	*3ADR010103*
CP604, CP607, CP610	
Operating instructions	*3ADR010300*
Installation instructions	*3ADR010100*
Drive manuals and guides	
ACSx80 firmware and hardware manual document numbers	
ACS380	
Firmware	*3AXD50000029275*
Hardware	*3AXD50000029274*
ACS480	
Firmware	*3AXD50000047399*
Hardware	*3AXD50000047399*
ACS580-01	
Firmware	*3AXD50000016097*
Hardware	*3AXD50000044794*
ACS880-01	
Firmware	*3AUA0000085967*
Hardware	*3AUA0000078093*
Drive Composer Entry/Pro Manual	*3AUA0000094606*

Download links

HMI and faceplate information and download site

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.

Table of Contents

CP600 HMI connection to ACSx80 via Modbus RTU

1 Introduction

This quick-start guide will explain how to download and install the HMI remote keypad project, developed by ABB, onto a CP600 HMI and explain the functionality that is to be expected on each page. For detailed information about the HMI or a particular drive, please refer to the appropriate hardware or firmware manual.

2 Safety

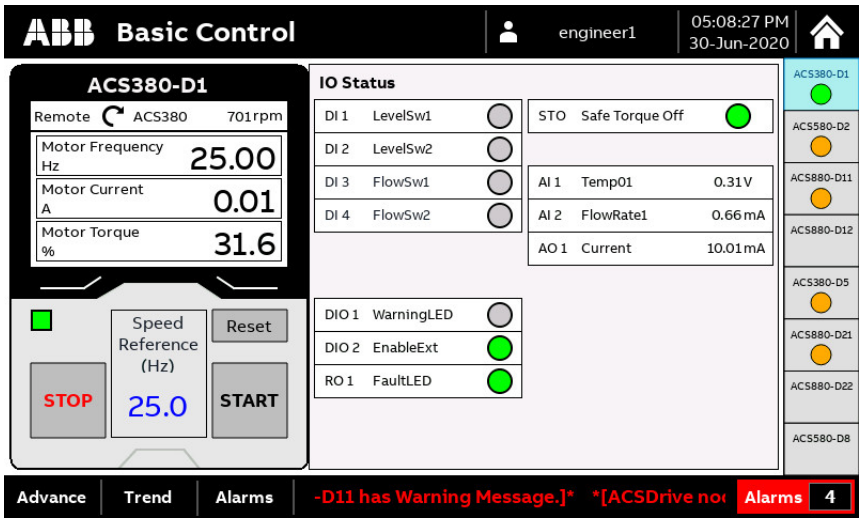
The respective HMI manual and drive manual contain safety standards that must be respected for personal safety and to avoid damage to equipment.

There are three levels of severity:

DANGER: Indicates that a failure to observe safety rules may cause death or serious injuries.

ATTENTION: Indicates that a failure to observe safety rules may cause damage.

CAUTION: Indicates that a failure to observe safety rules may cause defects to the equipment or inconsistencies.



3 Drives Faceplate Overview:

The Drives Faceplates for the CP600 HMI offer easy operator interface for the ACSx80 All-Compatible drives. Use this document to setup the face plates and connect to the drives.

3.1 Flow chart

- Perform ACSx80 installation according to the manual, make necessary communication cable connections
- Perform drive parameter setup according to the parameter table shown in this guide
- Perform HMI installation according to the manual
- Obtain HMI project file from microsite, and save to the USB drive
- Insert the USB drive with HMI project file into the HMI USB port
- Apply power to the HMI
- Using the instructions in this guide for the correct HMI panel, load the HMI project file from the USB drive
- Alternatively, use Panel Builder software to install the HMI project file

3.2 Hardware requirements

- CP600 HMI
- 24VDC power supply
- USB-pen drive (to load the HMI project to the panel)
- CP600 Modbus RTU serial cable - TK682
- ACSx80 drive(s)
- Optional: Ethernet patch cable RJ45 (future capability)
- 24V supply wiring
- Optional: USB comm cable for DriveComposer

4 Communications connectivity

The current project file available uses ModbusRTU protocol to communicate to the ACSx80 series All Compatible drives.

4.1 Modbus RTU

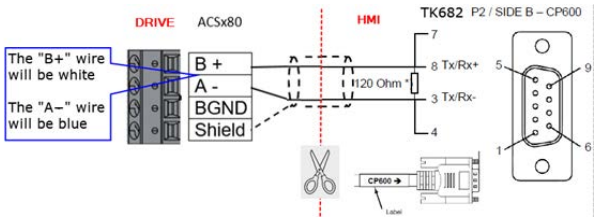
Using the ModbusRTU protocol with 2-wire RS485 wiring, up to 8 drives can be connected to the HMI network.

4.1.1 Modbus RTU serial cable

The TK682 cable can be used to provide the connection between the HMI and the first ACSx80 drive. Subsequent drives in the network should follow the ModbusRTU wiring instructions provided in the respective drive manual.

Use the following steps and the Figure below to convert a TK682 cable to connect the CP600 HMI to an ACSx80 Drive:

1. A TK682 cable will need to be stripped on the “AC500-eCo” labeled end to connect to the ACSX80 embedded fieldbus terminals, while the other end will mate with the CP600 HMI.
2. Each end of the TK682 cable has a 120 Ohm as a termination resistor between pins 8 and 3. These will remain in the cable on the CP600 side.
3. The wires on the Drive end, (originally labeled AC500-eCo), must be exposed, stripped and connected as follows:
   - White: connect to the B+ terminal on the ACSx80 Drive
   - Blue: connect to the A- terminal on the ACSx80 Drive
   - Shield: connect to the Shield terminal on the ACSx80 Drive



4.1.2 Single drive switch settings

a. Set the termination resistor switch to "ON" as per the diagram on the drive.

b. Set the bias resistor switch to "ON" as per the diagram on the drive.

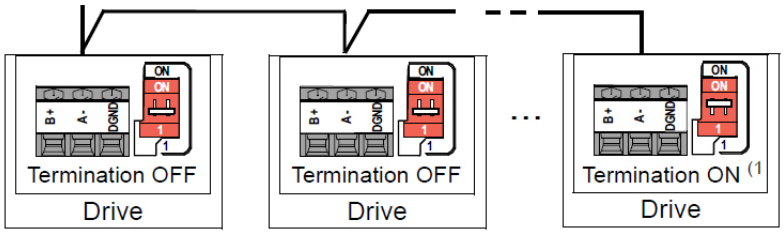
4.1.3 Multiple drive switch settings

a. Connect drive to drive by connecting Terminal B+ to B+, terminal A- to terminal A- and Shield to Shield terminal.

b. As per the diagram on the drive;

i. Set the termination resistor and bias switch(es) in the middle drives to "OFF"

ii. Set the termination resistor and bias resistor switch(es) in the last ACSx80 drive to "ON".



4.1.4 Example switch settings for ACS380

4.1.4.1 Termination resistor OFF

4.1.4.2 Termination resistor ON

5 Software

5.1 Configuring and programming software tools

The Drive and HMI can be setup and configured using the Drive Keypad and HMI Touchscreen. Software tools can also be used to setup and configure the drive and HMI. These optional programs are Panel Builder 600 and Drive Composer Entry or Drive Composer Pro.

Panel Builder 600: This software provides configuration, application loading and programming for the CP600 HMI. Use this software to load the application to the HMI directly from a PC without the use of a USB memory stick. The Panel Builder program would also be necessary if the user decides to modify the HMI project in any way, or to design their own screens. Please refer to the Panel Builder 600 manual.

Drive Composer Entry/Pro: These software tools provides configuration and parameter setting for the ABB Drive products. The Drive Composer PC Tool can be used to save and download a parameter file from and to the drive, or to adjust parameters manually. The drive parameter file would accompany the use of Drive Composer Entry/Pro.

5.2 Software needed

HMI project update file - to be copied onto the USB-pen drive to upload to the HMI

Optional: Panel Builder 600 Software

(Link to download:
https://new.abb.com/plc/automationbuilder/platform/software)

1. Select Installer options and additional tools
2. Check "HMI" > "Control Panel - CP600"
3. Basic license is enough for CP607. Other panels need Standard license)

Optional: Drive Composer Entry/Pro

5.3 Accessing the Software

Drives Faceplate File

Optional: *Panel Builder 600 or Automation Builder Software* (Panel Builder 600 can be purchased separately or as part of Automation Builder)

Optional: Drive Composer Entry/Pro (*Drive Composer - Software Tools*)

6 Setup

6.1 Drive setup

- Perform ACSx80 drive installation according to the drive manual, make necessary communication cable connections
- Use the drive keypad or Drive Composer to setup the drive parameters using the parameter table shown below
- The ACS380 provides the option to use the macro "AC500 Modbus RTU" with Par. 96.3

6.1.1 Minimum required parameter settings (based on factory default settings)

Parameter	Description	Setting	Comment
58.01	Protocol enable	Modbus RTU (1)	Initializes embedded fieldbus communication. (50.02 = disabled)
58.03	Node address	[Address]	Modbus RTU mode address of the drive
58.04	BAUD RATE	19.2 kbit/s (example)	Transfer rate of the link. Same baud rate must be defined in the Modbus RTU master. (HMI)
58.05	PARITY	8 EVEN 1 (example)	Parity and stop bits. Same parity and stop bits must be defined in the Modbus RTU master. (HMI)
58.14	Communication loss action	[optional] e.g. Fault (1)	Defines the drive operation after the communication loss.
58.15	Communication loss mode	Any message (1)	Defines how the drives check for a communication loss. This must not be set to “CW / Ref1 / Ref2” as those are only written in specifics screens.
51.16	Communication loss time	[optional] e.g. 60	Time between communication break detection and the selected action. 1 = 100 ms.
58.25	Control Profile	ABB Drives (0)	Communication profile “ABB Drives” is mandatory
58.26	EFB ref1 type	Speed or frequency (0)	Speed or Frequency is mandatory. The selection is made via control mode (Par. 99.04)
58.28	EFB ref1 type	Speed or frequency (0)	Speed or Frequency is mandatory. The selection is made via control mode (Par. 99.04)
58.33	Addressing mode	Mode0 (0)	16-bit values (groups 1...99, indexes 1...99)
58.101	Data I/O 1	CW 16bit (1)	Control Word in 16 bit
58.102	Data I/O 2	Ref1 16bit (2)	Reference value 1 (e.g. speed) in 16 bit
58.103	Data I/O 3	Ref2 16bit (3)	Reference value 2 (e.g. torque) in 16 bit
58.104	Data I/O 4	SW 16bit (4)	Status Word in 16 bit
58.105	Data I/O 5	Act1 16 bit (5)	Actual value 1 (e.g. speed) in 16 bit
58.106	Data I/O 6	Act2 16 bit (6)	Actual value 2 (e.g. torque) in 16 bit
20.01	Ext 1 commands	Embedded fieldbus (14)	Embedded Fieldbus interface as source for start and stop
22.11	Ext1 Speed ref1	EFB ref1	Embedded Fieldbus interface as source for speed reference
58.06	Communication Control	Enable	To refresh the changed communication settings

Check that the motor data is setup correctly.

The drive is now ready to be controlled by the HMI.

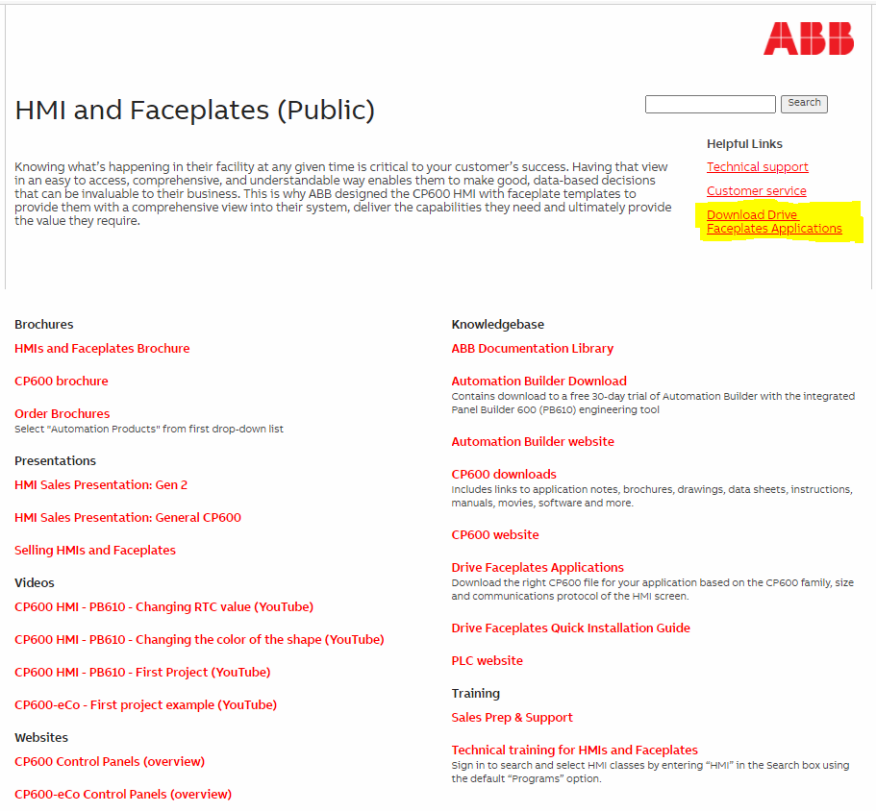
6.2 HMI setup

6.2.1 HMI setup flow chart

- Perform HMI installation according to the manual, including connecting the ModbusRTU communication cable.
- Obtain HMI project file from microsite, and save to the USB drive
- Insert the USB drive with the HMI project file into the HMI USB port
- Apply power to the HMI and load the project file from the USB drive using the following instructions
- Panel Builder may also be used to load the HMI project file

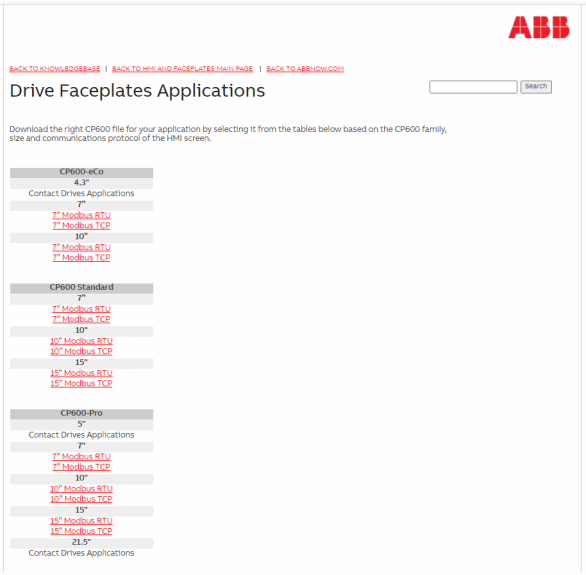
6.2.2 Downloading the drive faceplate application

The Drive Faceplates applications are available at the HMI and Faceplates (Public) (abbnow.com) site. Click the "Download Drive Faceplates Applications" link.



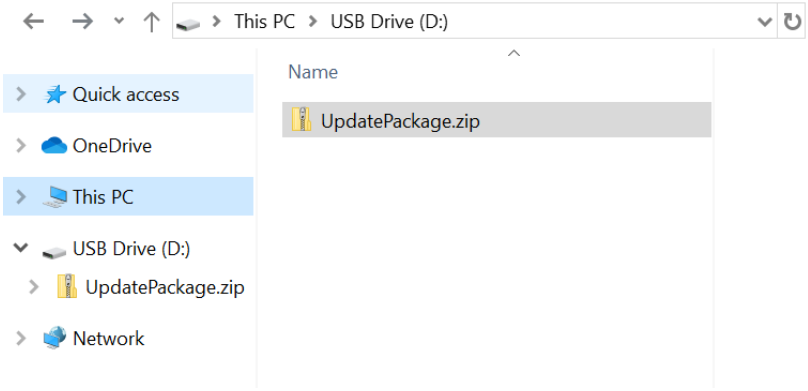
Determine the CP600 Type, Size and communication protocol that will be used and click on the associated link.

After the file downloads, save the file to your computer.



6.2.3 Loading the HMI with a USB-pen drive:

Load the provided file "UpdatePackage.zip" to the root of your USB-pen drive

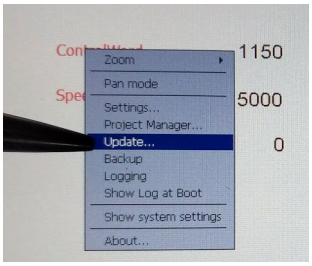


Insert the USB-pen drive into the CP600 HMI

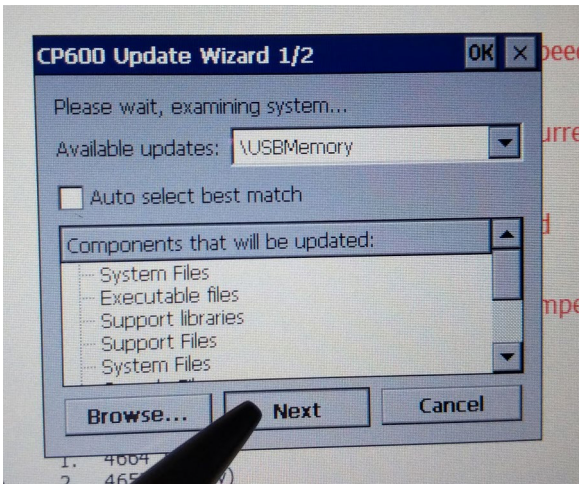
6.2.4 Loading to a panel with an existing project

a. Press on a free space on the panel for about 3 seconds: the context menu pops up

b. Select "Update"



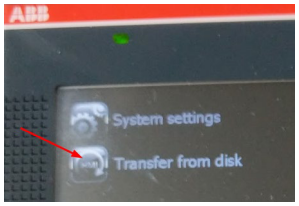
c. In the update wizard keep defaults and press Next ("\USBMemory")



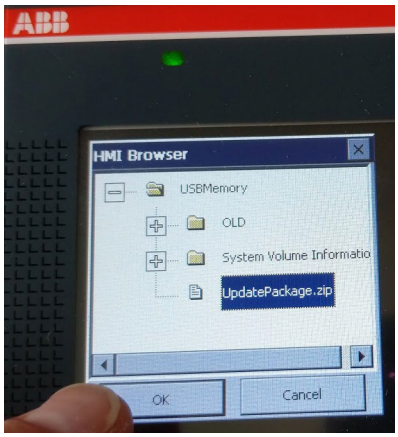
→ the project will be updated and loaded.

6.2.4.1 Loading a new Gen 1 CP600

a. Press on the "Transfer from disk" icon



b. Select the "UpdatePackage.zip" file and press OK

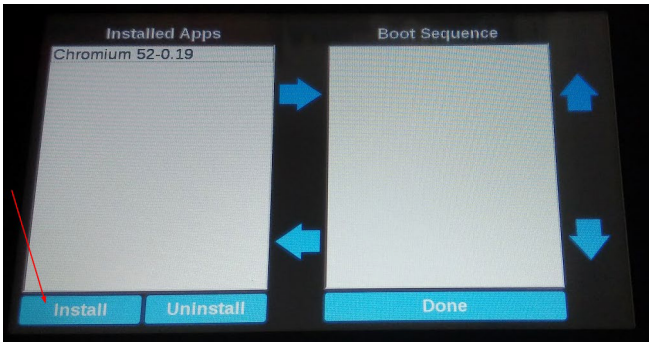


→ the runtime will be installed and the project will be loaded.

6.2.4.2 Loading a new CP600-eCo, -Gen2 Standard or -Pro

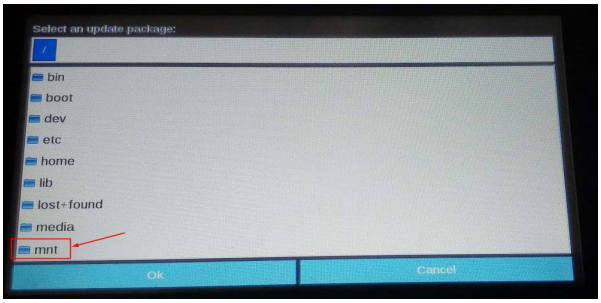
a. On the first screen select click on "Startup Sequence"

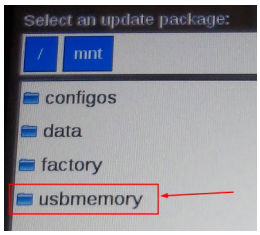
b. Next select "Install" (do not install the Chromimum)



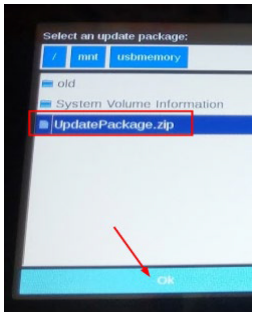
c. Next select the path to the USB-pen drive:

mnt/usbmemory/





d. Select the "UpdatePackage.zip" file and press OK



→ the runtime will be installed and the project will be loaded.

After that the panel reboots automatically.

6.2.4.3 Accessing the system setting menu

If you make a mistake during the project loading process, you can access the system update menu again, by holding your finger on the screen in any unused space for 3 seconds, after 3 seconds the context menu will pop up. Follow the steps under "To a panel which already has a project loaded" to try reloading the project.

Alternatively, you can cycle power to the panel, and tap the screen several times while the ABB logo is displayed during the boot-up process. This will cause the panel to enter the system settings menu, and a message will be displayed notifying the user that the panel is entering this mode. Once in the system settings mode, you can resume the process to load the project from the USB memory stick.

6.2.5 Loading the HMI with Panel Builder 600 software

Refer to Chapter 8 of the Panel Builder Software Manual "Transferring the Project to HMI Device"

1. See CP600 manual to assign an IP address to the HMI panel
2. Open PanelBuilder600 Software and open the HMI project file (.jpr)
3. From the menu, select "Run" > "Download to target" ()

   Once the project has loaded, you can navigate the pages to set up the panel and the drives you have connected.

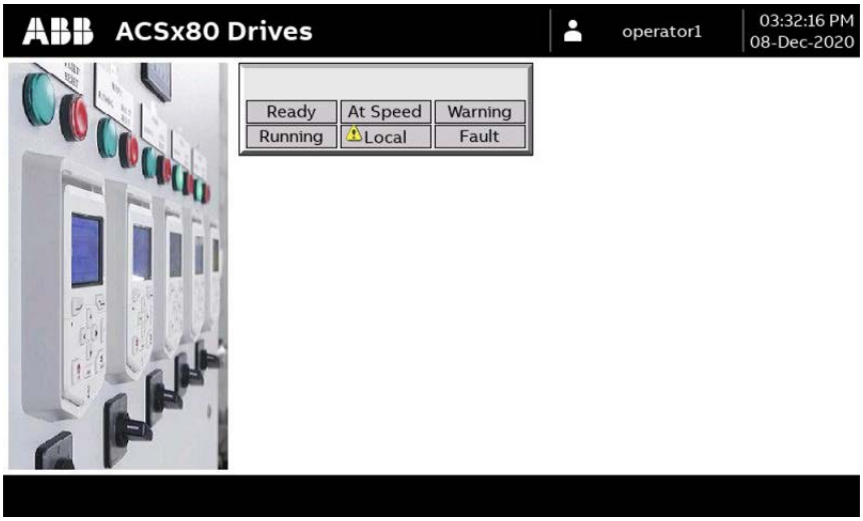
7 Commissioning the drive faceplate application

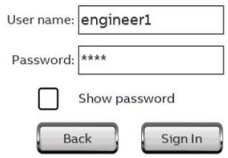
Once the HMI project is loaded, the Main page will be displayed. The HMI must now be configured to communicate with the drives that are on the HMI network. To begin, log in to the HMI with admin privileges by following the instructions in the next paragraph.

7.1 Accessing the initial user setup

Once the project is loaded, to access advanced settings for drives and panel configuration, select the user torso icon and enter

User	Password	Operations
admin	1234	can access Drives and Panel settings pages
engineer1	1234	can access Drives and Panel settings pages
operator1	1234	Limited access. Drive monitoring and control only.





7.2 Password

Currently, this can only be done by updating the password settings in the project file using the Panel Builder software. Once updated to the desired password settings, the project must be updated in the HMI.

Updating the password from the panel may be a feature available at a later release of the project file.

7.3 Panel setup

After logging into the HMI with admin. privileges, more options will be seen on the bottom left to configure the panel and drive settings.

Click the button for Panel Settings to access the Panel Configuration page.

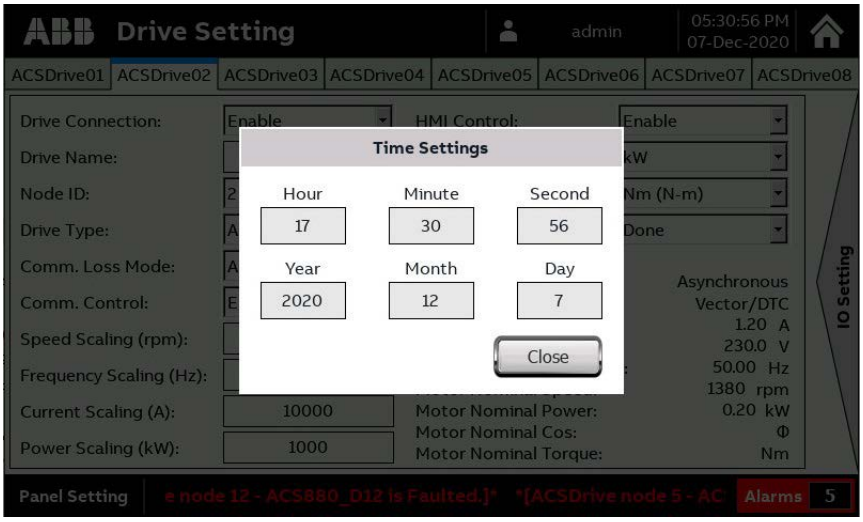
Set the parameters for the panel in the Serial Communication Parameters area, located on the right side of the page.

Adjust the panel settings communicate with the drives that are connected to the network. For the ACS380 it should be; 8 data bits, 1 stop bit, parity EVEN, 19.2k baud, RS485 mode, and press APPLY.

Adjust the display brightness from this page by tapping the Display Brightness dropdown field and selecting the desired brightness percentage.

7.4 Setting date and time

Adjust the panel time by touching the date/time in the upper right corner.

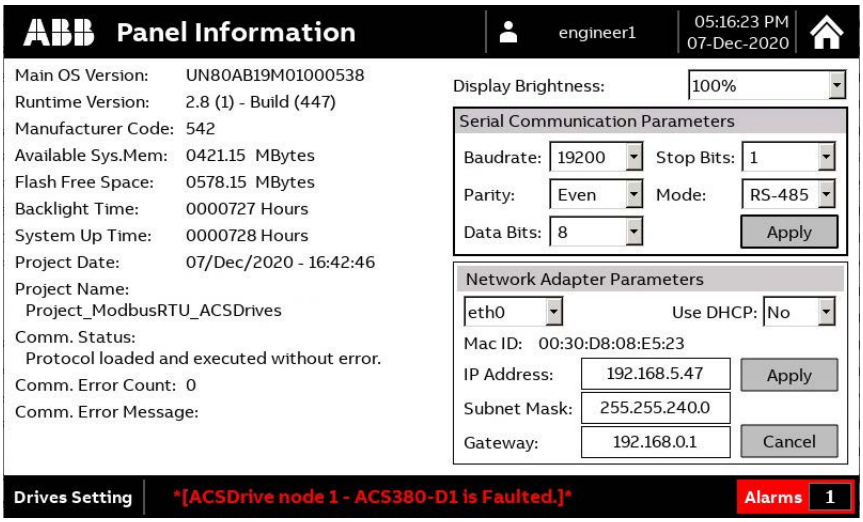


7.5 Communications setup

7.5.1 Modbus RTU setup

Go to the Drive Setting page by pressing the button in the lower left corner.

- Network Adapter Parameters apply to ModubusTCP and will be covered at a later time in an updated version of this document.



7.6 Individual drive setup:

- Apply parameters to each tab for as many drives as you have connected in your serial network, up to 8.

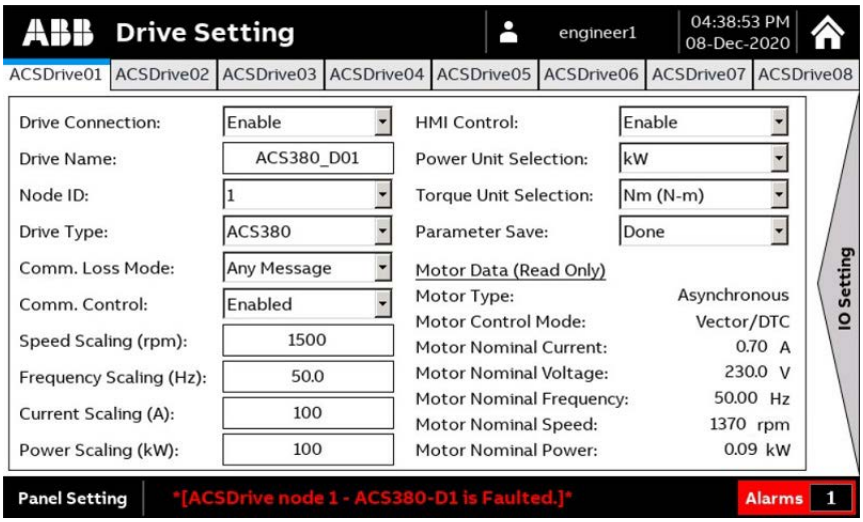
7.6.1 Drive information entry

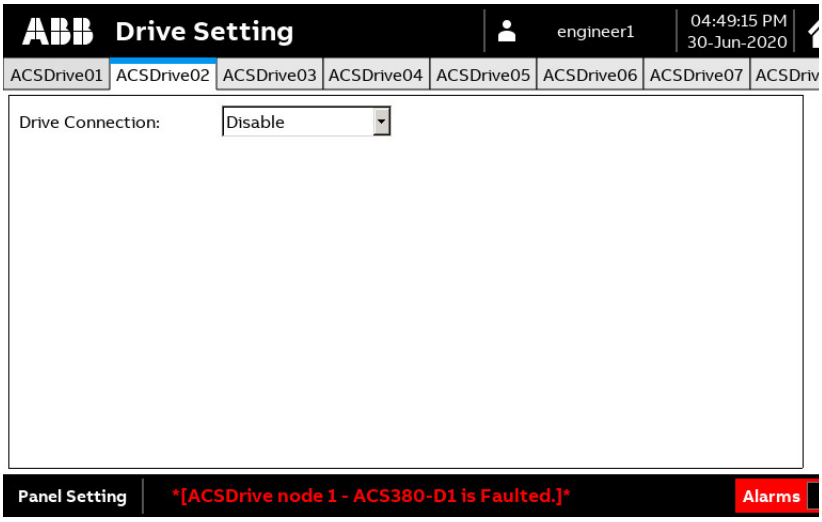
- Enable the drive connection
- Name the drive
- Set the Node ID for the drive to match the Node Address in Parameter 58.03 for that drive.
- Comm Loss mode must be set to "Any Message"
- Set comm control to "enabled"
- Set the scaling parameters according to your drive
- Set HMI control to "enable"
- Select units accordingly for power and torque
- Select "parameter save" to save your changes

The initial connection is for one drive, go to other drive tabs to enable and configure as many as you have connected, up to 8.

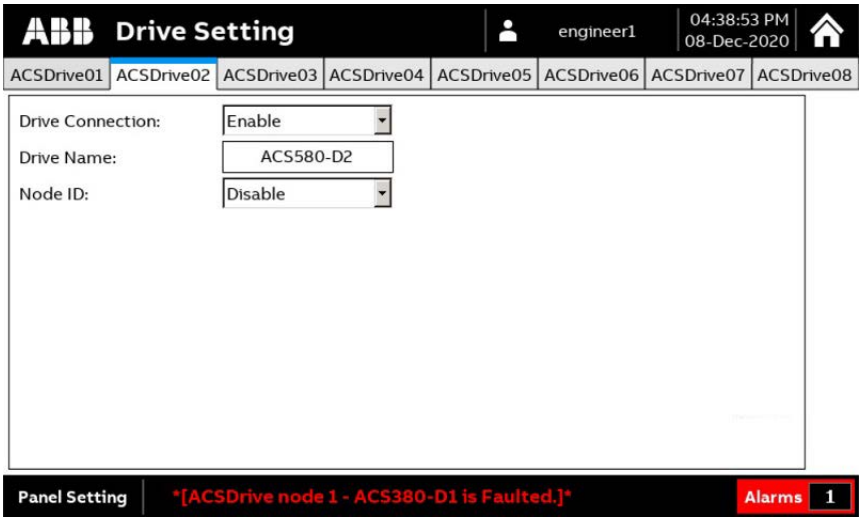
- The IO setting can be accessed from this page.

When the drive settings are complete, the drives on the network will appear on the main page (shown in the main_page description)

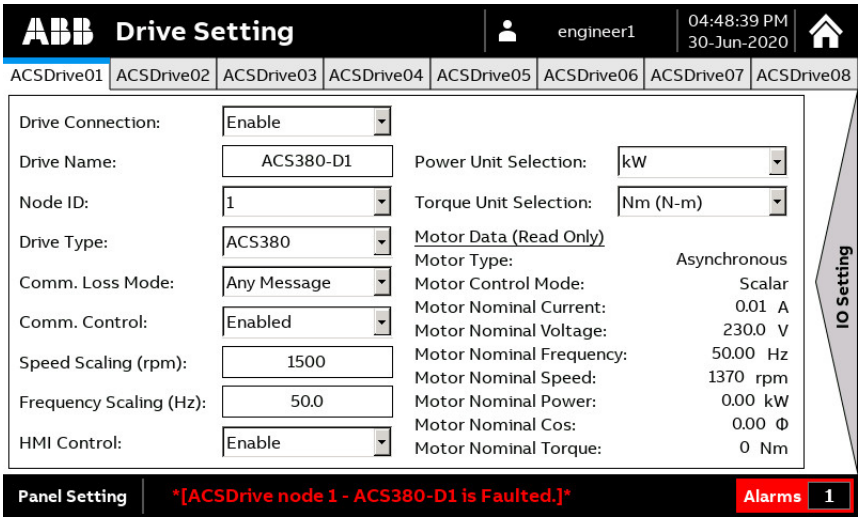




Drive 02 tab initial view



Drive 02 tab view after ‘enable’ selected, and name given



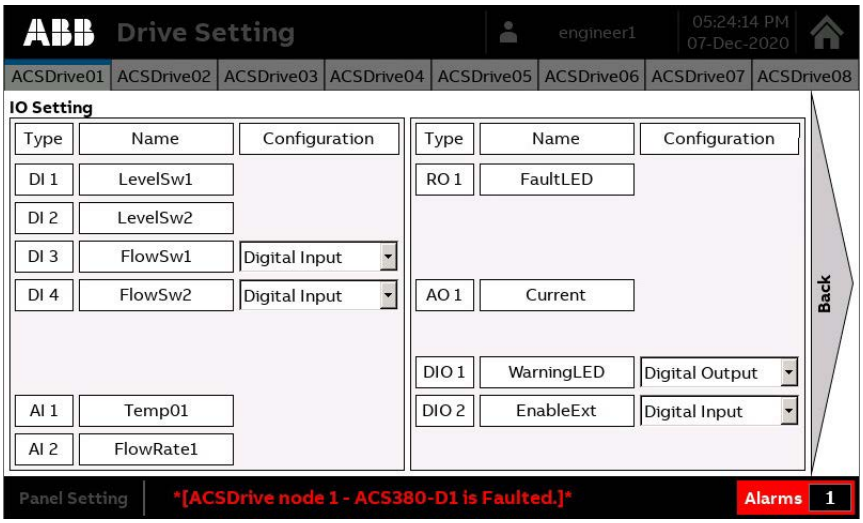
Drive 02 tab view completed

7.6.2 I/O information entry:

On this page you have the option to name the IO points that will be displayed on the Basic Control page with the Keypad emulator

The IO can be named for each drive that is connected to the network. Access each IO setting page by clicking on the drive tab you wish to edit.

To return to the Drive Setting page, click the back arrow on the right side of the screen



8 Operating the drive faceplate application:

8.1 Common features:

8.1.1 Features common to all operating pages

- Scrolling alarm/fault display at the bottom of the screen
- Alarm counter at bottom right corner; displays total number of active alarms/faults
- Home icon, to access the main page from any other page
- Time/date display at top right corner, just to the left of the Home icon

8.1.2 Features common to all non-main/home pages:

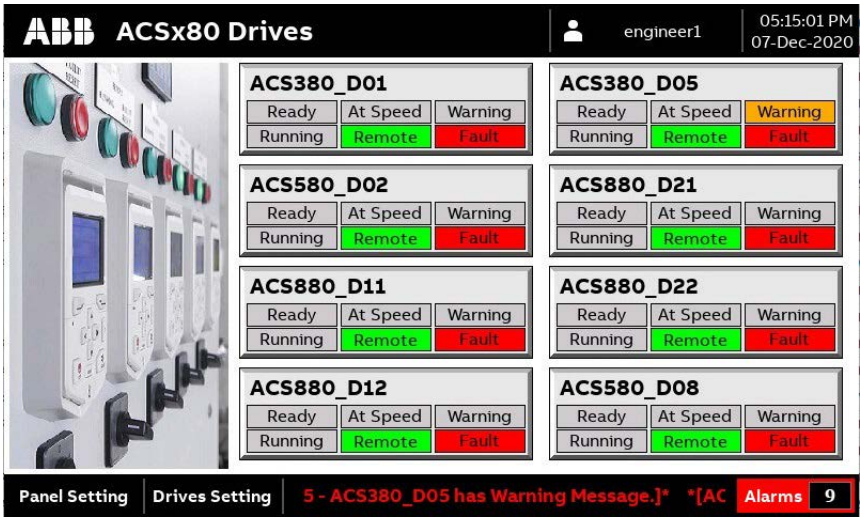
On these pages, there is a column shown on the right side of the screen that displays the current Ready/Faulted/Warning status of all drives and their names which are connected to the network

8.2 Main/Home Page

The main page displays the current time in the upper right corner, the status of the drives that are connected, buttons for drive settings, and panel settings. To access the drive you wish to control, tap on the status box for that drive. This will take you to the Basic Control page with keypad emulator for the selected drive.

The default account that is logged in, is shown in the top bar on the right side. To log in with a different account, such as admin, touch the torso icon. The password for all of the available accounts is the same (1234).

Currently, the available accounts are: admin, Operator1, Engineer1



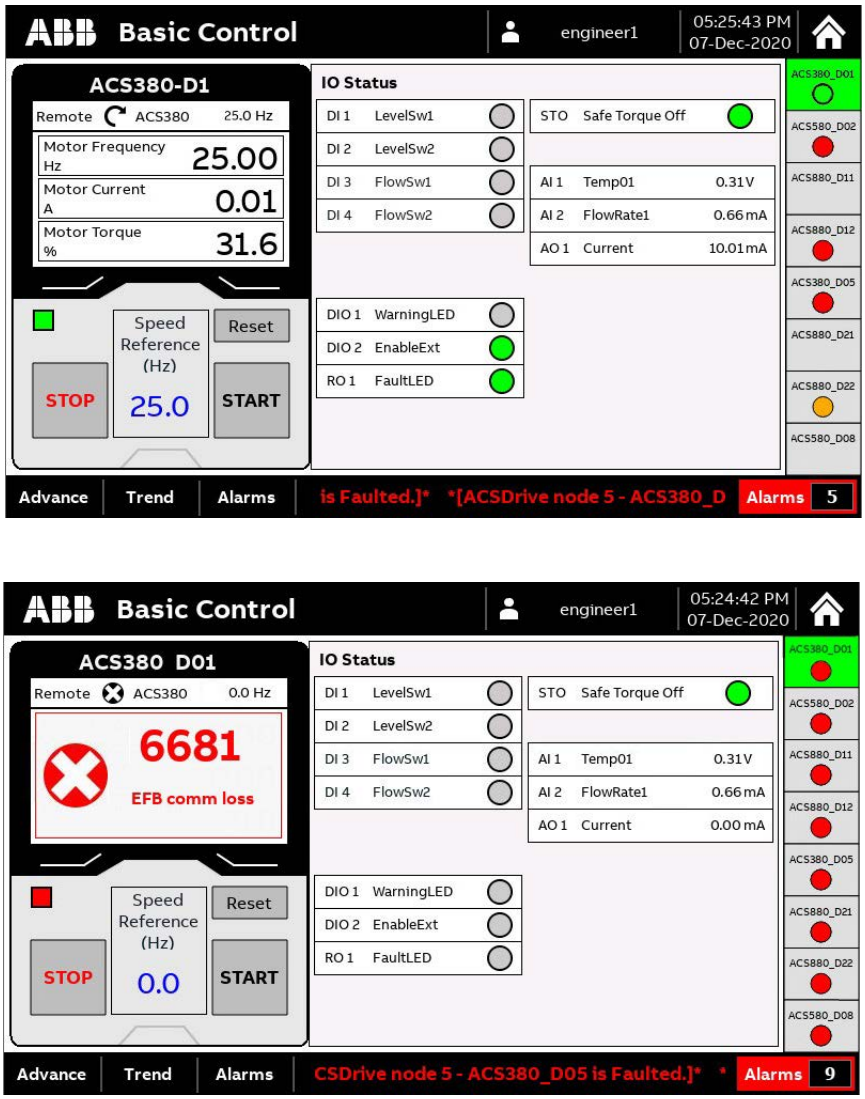
8.3 Basic control page

This page gives you the ability to use a keypad emulator to control the drive with start, stop, and speed reference controls. The keypad emulator also displays actual values of motor frequency (Hz), motor current (A), and motor torque (%). Fault and warning conditions are indicated by a blinking 'LED' as it would be on the Assistant Control Panel (ACS-AP-x).

The fault/warning hex code will also be displayed in the keypad emulator to quickly identify the condition.

One of the main features of the basic control page is the IO status display with the IO names that were given in the Drive Settings step.

Other options on this page are buttons to navigate to the Trend page, Alarms page, and Advance control page, or return to Main page (home icon), or Login page (torso icon).

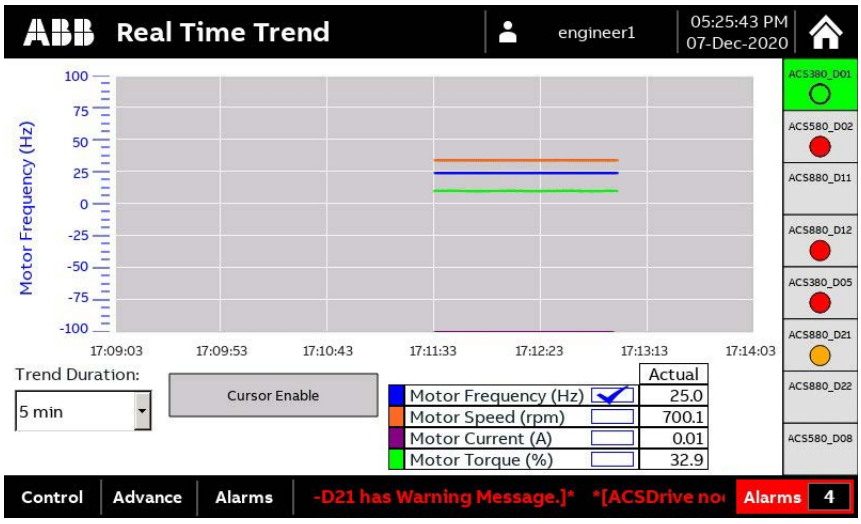


Basic Control page display with faulted condition

8.4 Trending page

- This page will allow you to display a graphical trace of 4 actual values; motor frequency, motor speed, motor current, and motor torque. There is also a 'cursor enable' option. The cursor will allow you to move the cursor on the graph to measure a point of interest on the monitor. You can also change the duration of the window from 1, 5, or 10 minutes. The data in the monitor is not retentive. If you navigate away from the trend page, the monitor will restart.

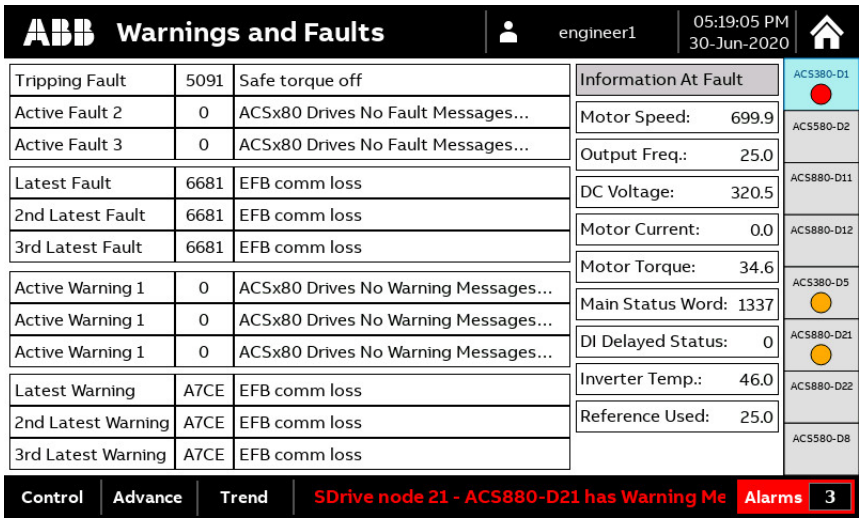
- Other options on this page are to navigate to main page (Home icon), Login page (torso icon), navigate back to the basic control page, or navigate to the advanced control page.



8.5 Alarms page

- This page displays active faults and warnings as well as most recent faults and warnings. Also shown is actual values at fault; Motor Speed, Output Freq, DC Voltage, Motor Current, Motor Torque, Main Status Word, DI delayed status, Inverter Temp, Reference Used.

Navigation to Main page (home icon), login page (torso icon), Control page, Trend page, and Advanced page



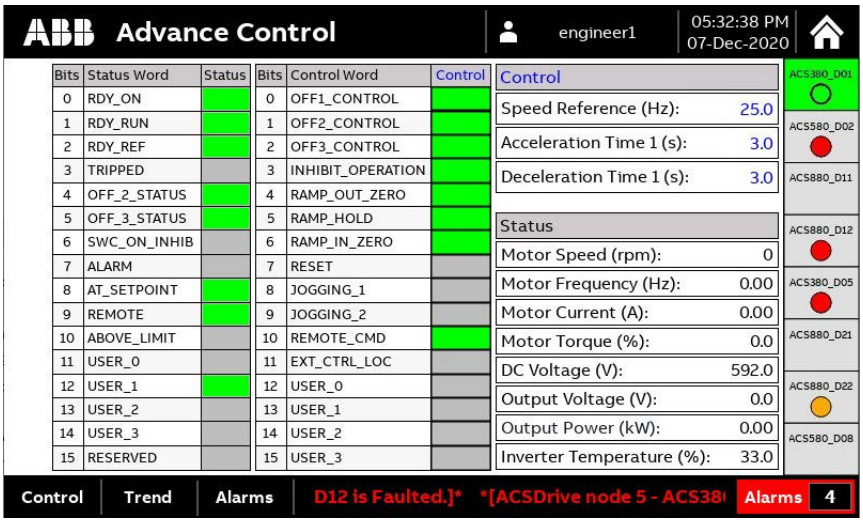
8.6 Advance control page

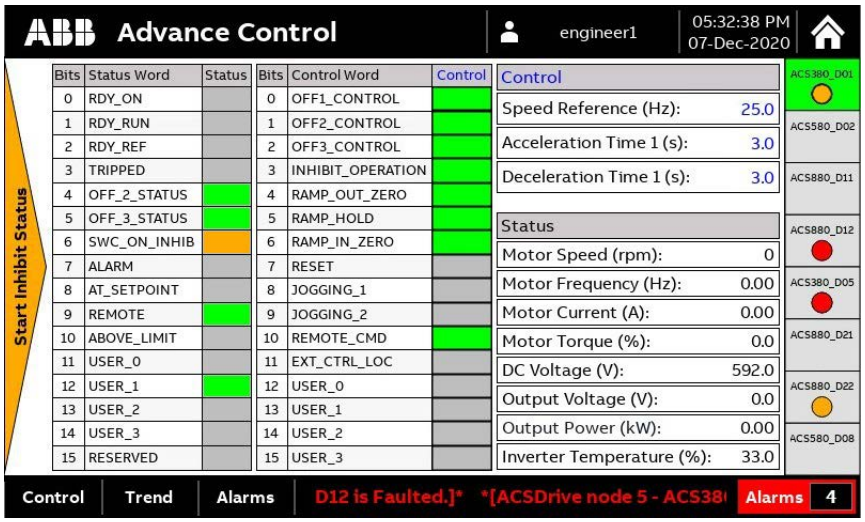
8.6.1 Status and control words with other drive information

- On this page, each bit of the Main Control Word, and the Main Status word is shown. This gives the user a better idea of the full picture of the drive status. Actual values are also shown; Motor Speed, Motor Frequency, Motor Current, Motor Torque; DC Voltage; Output Voltage, Output Power; Inverter Temperature. If the drive has an OFF2 or OFF3 Emergency stop condition, the start inhibit navigation button will appear on the left side, and you can navigate to the start inhibit page to identify the condition.
- The speed reference, Accel time 1, and Decel time 1 can also be changed from the Advance Control page in the upper right part of the page.
- Press the "Start Inhibit Status" triangle to review the status of the Start Inhibit parameter bits

Gray	=	OFF or 0
Green	=	ON or 1
Yellow	=	Alarm

Navigate to Main page (home icon), login screen (torso icon), Basic control page, Trend page, Alarm page.

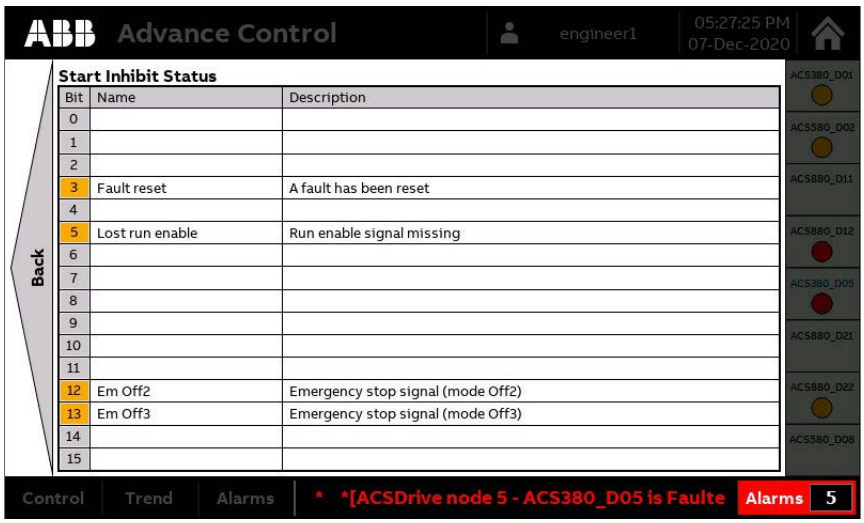




8.6.2 Start inhibit

- This page shows the start inhibit status word. The Start inhibit status word specifies the source of the inhibiting condition that is preventing the drive from starting. After the condition is removed, the start command must be cycled.

To return to the Advance Control page, press the back arrow on the left side of the screen



Appendix A Cable solutions:

As an alternative to connecting the HMI panel to a drive using the ABB TK682 cable, a 9 pin DSUB breakout board connector could be used to supply your own terminating resistor and cable according to the diagram in the 'Serial Cable and Connection' section above.

- Below is an example from Winford Engineering:

BRKSD9M Rev A Specifications

Ambient Temperature	-20°C to 85°C
Ambient Humidity	10% to 90% RH, non-condensing
Voltage	200V maximum between any two signals
Continuous Current	2.25A maximum on any signal
Screw Terminal Size	Accepts 16 - 26 AWG wire

Part Number Ordering Information

BRKSD [ ][ ][ ] - [ ]
1 2 3 4

1. Connector Positions

- **9** DB9
- **15** DB15
- **15HD** DB15 High Density
- **25** DB25
- **26HD** DB26 High Density
- **37** DB37
- **44HD** DB44 High Density

2. Connector Gender

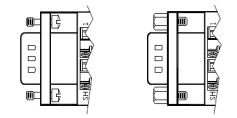
- **M** Male (Plug)
- **F** Female (Socket)

3. Product Version

- **V***n* or blank, depending on product

4. Connector Style and Hardware

- **C** Right Angle with Captive Male Screws
- **R** Right Angle with Jack Screws



Captive Screws

Jack Screws

BRKSD9M Stocked Part Numbers

The following part numbers represent standard options and are stocked:

- BRKSD9M-C
- BRKSD9M-R

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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

You can find manuals and other product documents in PDF format on the Internet at *www.abb.com/drives/documents*.

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