

The Application Note is pertinent to the Unidrive Classic Family

## Unidrive Classic Data Extraction/Replacement Instructions using CTSOft

### Introduction

Unidrive Classics contain approximately 500-600 parameters that help machine manufacturers achieve the desired functionality for a certain machine requirement. Some applications may require 20-30 or more parameters to be changed from the drives factory default settings. Should drive replacement become necessary, one must have a list of these parameters so that the original functionality can be restored. This can be done manually although it is rather tedious.

Unidrive drive parameter data can be extracted from a drive shortly after commissioning and saved to disk with Control Techniques Windows based application CTSOft. Ideally this is done as insurance for future use, when drive replacement becomes necessary.

If one did not have the foresight to do this before the Unidrive required replacement (and do not have a list of the drive data parameters on hand), the easiest way to program a replacement drive is to extract the parameters out of the malfunctioning unit with CTSOft (assuming that it still works enough to light the display) and program the replacement drive with this data.

This application note was specifically created for those situations where the Unidrive contains a UD7x coprocessor with an active Application Program inside. CTSOft will extract all program data both in drive memory and the coprocessor memory. If one does not have a UD7x in the Unidrive Classic, one should use the simpler software extraction tool, UniSoft. Consult [CTAN182](#) by typing into Google or click the blue link. CTAN182 will describe how to determine the conditions mentioned above.

This application note will describe all the steps to connect to a Unidrive Classic with CTSOft, extract all the drive parameter data, save this data to a disk file, and then load this data into a replacement drive. One may be simply be interested in Saving the Drive Parameter Data to disk or may need to Restore Drive Parameter Data from disk (from a previous session) and loading that data into a replacement Unidrive Classic. To facilitate this, an active table of contents is provided to allow quick navigation to the topic of interest.

# Table of Contents

Scope .....	0
Introduction .....	0
Getting CTSOft.....	2
Extracting Parameter Data from a Faulty Unit.....	3-7
Saving Drive Parameter Data to Disk.....	8-9
What do you want to do now? .....	11
Retrieving the Parameter Data from Disk .....	12
Getting Drive Parameter Data into Replacement Drive .....	12-16
Troubleshooting: Failure to Establish Communication .....	17-18

**This Table of Contents is electronically active.**

**Simply click on the topic of interest**

In order to use CTSOft to extract and save the original drive data one must have the following:

1. A suitable "port" fitted to the Unidrive Classic
2. A suitable communication port available on the PC / Laptop
3. A quality RS-232 serial data communication cable.

Additionally, the Unidrive Classic firmware must be a major revision of 3 (Parameter #0.50 should display as "3.xx.xx" where xx.xx does not matter) to be usable with CTSOft.

4. CTSOft installed on a PC / Laptop running Microsoft's Windows Operating System.
  - WinXP Professional (32 bit edition) is recommended.
  - Windows 2000 Professional also works, but is no longer supported by Microsoft.

### **Suitable Unidrive Classic ports:**

If a UD7x co-processor module is present, such as a UD70 or a UD73 through UD77, port C is used with the MD29MON protocol option in CTSOft. Note that #17.01 will display a value of one ("1") in this case and #17.02 should display a value of "262" or greater (307 is current).

If a UD71 is present, port D is used with the ANSI protocol option in CTSOft. Note that #17.01 will display a value of zero ("0") in this case

If no UD7x is present, it is recommended that the Unidrive be powered down and a UD71 Communications module be inserted into the malfunctioning unit and port D be used with the ANSI protocol option in CTSOft.

### **Suitable PC Communication ports:**

CTSOft works with a "legacy" RS-232 communication port with no additional hardware.

CTSOft also works with a USB port and a USB to Serial converter / driver combination. Two units known to work with CTSOft are.

1. Manufacturer – Vscomm M/N USBCOMM
2. Manufacturer – IOGEAR M/N GUC232A

Additional units are known to work. Many units that features a full UART / PCI "bridge" chip and driver disk is likely to be configurable to work with CT soft.

### **Suitable RS-232 Serial data cables:**

The data cable is simply a quality RS-232 serial extension cable (NOT a null modem or interlink style cable). As a convenience to our users, CT offers part number CTD-PC-232-006 in a 6 foot length and part number CTD-PC-232-010 in a 10 foot length.

### **Getting CTSOft**

CTSOft is a Microsoft Windows program available free from the Control Techniques website. Using a laptop, this program can upload the original data and Save the Data to Disk, which could later be downloaded into the replacement drive in a similar manner.

CTSOft version 1.09.01 (English) is current revision when this app note was written, and is available at:

[\*\*CTSOft\*\*](#)

CTSOft was constructed using Microsoft's Visual Studio and requires the .NET Framework 2.0 to function. The redistribution package for this is obtained from Microsoft directly (file is "dotnetfx.exe" version 2.0).

A suitable link for the Microsoft .NET Framework Version 2.0 Redistributable Package (x86) is provided:

[\*\*NET Framework\*\*](#)

Download the packages, install using a user account with administrator privileges on the PC / Laptop, and register the installation to "activate" from a PC / Laptop. World Wide Web access and an e-mail account are needed to get the software "activation" initialized and completed.

## Extracting Parameter Data from a Faulty Unit

### **IMPORTANT**

It is important that all the option modules are inserted that are supposed to be present for your drive application at the time that the data is extracted or restored. Do not remove options modules to record or load data.

Examine the internal area under the control cover. If this top bay is already populated with a large option module, inspect Parameter **#17.01** and confirm that this is a value of one (1) (UD70 co-processor present) or a value of zero (0) (UD71 Communication option present).

If **#17.01** indicates the presence of a UD70 co-processor, inspect parameter **#17.02** (UD70 system version) and insure that the contents is 262 or greater (system file 2.06.02 is **MINIMUM**). Note that 307 (system file 3.00.07) is current for parameter **#17.02** at the time of this application note.

If the large option module location is empty, you will need a UD71 Communication option module to extract or re-load drive data.

Insert the UD71 into the top bay of the Unidrive with power off as shown.

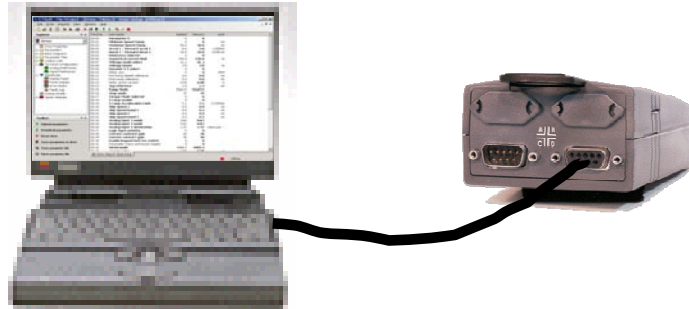


Never insert or extract modules from the Unidrive while power is applied!

Control Techniques recommends letting the drive fully discharge before inserting/extracting an Option Module. Safe discharge time is 10 minutes.

## **Connecting to the drive using a UD71 and the ANSI protocol**

Plug a straight through RS-232 cable PN CTD-PC-232-006 (or -010) into your PC then into port D of the UD71 module. (If a UD7x co-processor module is used, you must use a port C – see next page).



Apply power to the drive, and check and confirm with the Unidrive Keypad that **#11.24** is at “ANSI 4” (1). If not, the original value will need to be noted, and then **#11.24** set to the value “ANSI 4” (1). This would mean that you will need to restore the original value after you’ve completed your communication work with CTSOft.

Inspect and note the value of the following communication setup parameters:

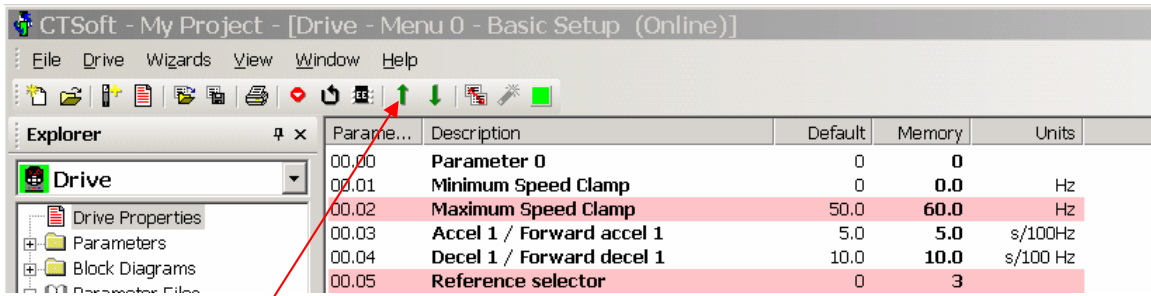
- **#11.23** – default value of 1.1 corresponds to node 11
- **#11.25** – default value of 4800 (0) corresponds to 4800 baud

You will need to match these communication settings in CTSOft to connect to the drive.

## **Extracting the data from the drive using a UD71 and the ANSI protocol**

Start CTSOft, pick the Unidrive, go on-line, and upload the drive parameters:

- At the Startup dialog choose “Work with a drive” and select Unidrive via pull down.
- Click OK to finish selection, and then click OK twice, to dismiss the advice / warning dialogs that follow.
- Apply power to the drive and confirm that CTSOft is for ANSI comms at the expected communication setup values.
- Click the “Toggle the On-Line status” menu button (is red at the moment) to go on line and:
  1. Click the “Change the program to match the drive configuration” at the “Mismatch Detected” dialog.
  2. If an “Unknown Firmware Version” dialog appears, note the details and click the OK to dismiss the dialog.
  3. Next, an “Information: Going Online” dialog appears and informs you that an automatic backup has been created. Click OK to dismiss the dialog.
  4. If a CTSOft dialog appears, note the details and click OK to dismiss.
  5. CTSOft is on line and scanning parameters, and the “Toggle the On-Line status button” is now green.



Click the “Unload the parameters from drive” menu button. Note the “Uploading the parameters from the drive” dialog appears, and a confirmation is provided when done.

[If you experience communication problems go to page 17](#)

## Skip this page if you are using a UD71 module.

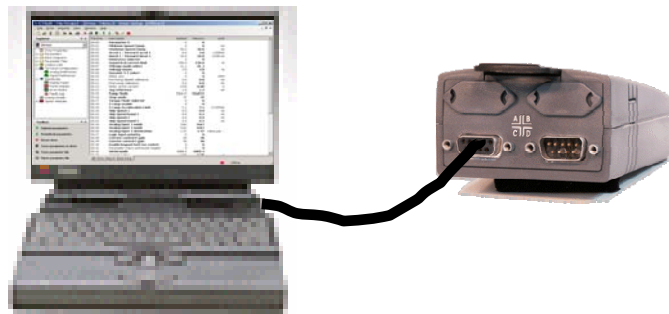
---

### Connecting to the drive using a UD7x and the MD29MON protocol

If a drive contains an UD7x variant which can be:

UD70	Co-Processor without a Fieldbus
UD73	Co-Processor with Profibus
UD74	Co-Processor with InterBus S
UD75	Co-Processor with CT Net
UD76	Co-Processor with Modbus Plus
UD77	Co-Processor with DeviceNet or CANOpen

This implies that you will use the 9 pin female connector on the lower tier port C as shown below using a straight through RS-232 cable (P/N CTD-PC-232-006) coupled to your PC and using the MD29MON communication protocol.



Check and confirm that both **#17.21**, as well as **#17.13** is at a value of zero (0). If they are not, you will need to change these to permit communication and reliable interaction with this module. This would mean that you will need to record these values and they will need to be restored after you've completed your communication work with CTSOft.

If you change **#17.21** or **#17.13** you will need to go to parameter **#0.00** and enter 1070 followed by the RED button. This causes the co-processor to re-read these setup parameters and begin using these communication settings.

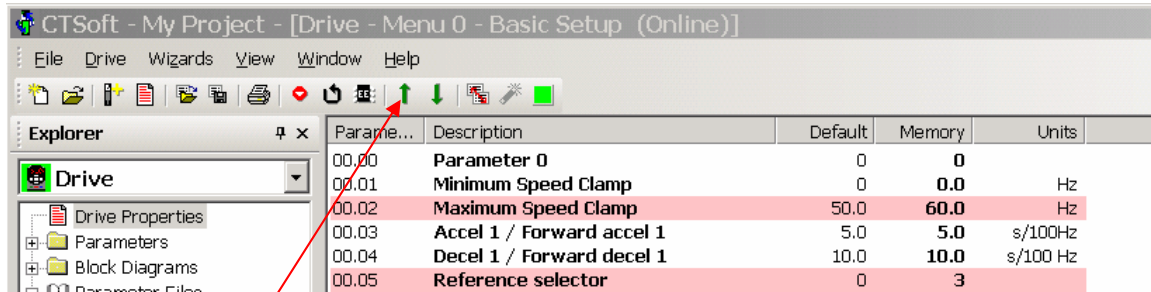
No special communication settings are required for MD29MON protocol, as the node, baud and character framing are fixed.

### Extracting the data from the drive using a UD7x and the MD29MON protocol

Start CTSOft, pick the Unidrive, go on-line, and upload the drive parameters:

- At the Startup dialog choose “Work with a drive” and select Unidrive via pull down.
- Click OK to finish selection, and then click OK twice, to dismiss the advice / warning dialogs that follow.
- Apply power to the drive and confirm that CTSOft is set for MD29MON comms at the expected communication setup values.

- Click the “Toggle the On-Line status” menu button (is red at the moment) to go on line and:
  - Click the “Change the program to match the drive configuration” at the “Mismatch Detected” dialog.
  - If an “Unknown Firmware Version” dialog appears, note the details and click the OK to dismiss the dialog.
  - Next, an “Information: Going Online” dialog appears and informs you that an automatic backup has been created. Click OK to dismiss the dialog.
  - If a CTSOft dialog appears, note the details and click OK to dismiss.
  - CTSOft is on line and scanning parameters, and the “Toggle the On-Line status button” is now green.



Click the “Unload the parameters from drive” menu button. Note the “Uploading the parameters from the drive” dialog appears, and a confirmation is provided when done.

[If you experience communication problems go to page 17](#)

## **Menu 20 Parameters**

Menu 20 parameters are typically used for fieldbus communications purposes. The first twenty parameters and the last two are used to configure and monitor the status of the fieldbus port.

CTSOft will upload Menu 20 parameters when you are connected to the co-processor. These values can then be printed out and be hand entered if need be should an UD7x coprocessor be replaced.

If these values are re-entered by hand they will need to be stored. Storing Menu 20 parameters is accomplished by setting **#17.19=1** then depressing the RED button.

**Note:** A standard drive parameter store **does not** store Unidrive menu 20.



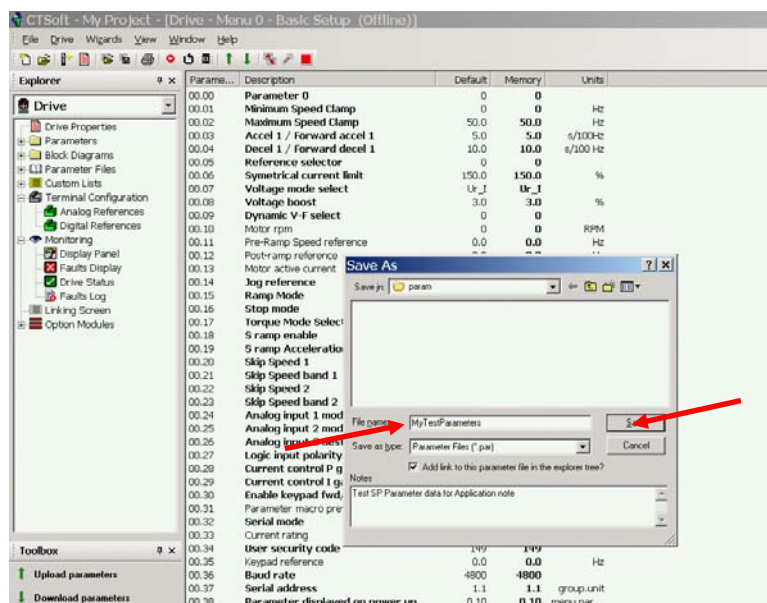
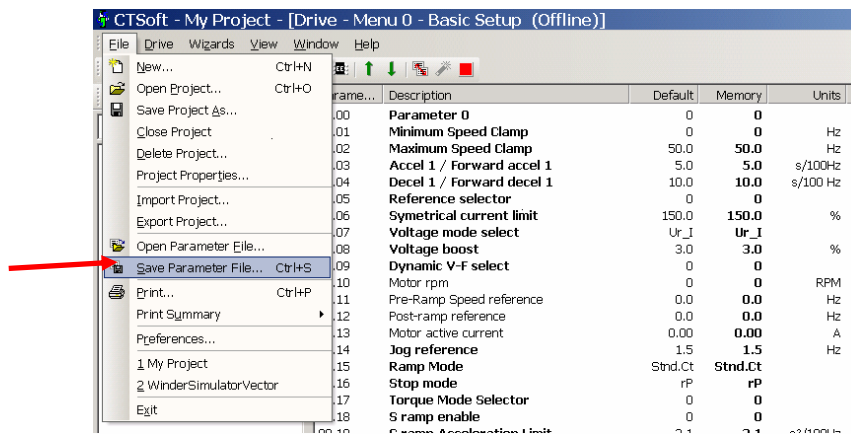
## Saving Drive Parameter Data to Disk

Once you have uploaded the data from the original drive, you should save it to disk so that it is recorded on your PC. Some insight into how CTSOft organizes and stores drive parameter data is useful to properly save this data.

CTSOft is project oriented, and will save the drive parameter file to the present project. When one starts CTSOft with the “Work with a drive” option, the current Project is the default Project called “My Project”. Note that the **My Project** folder is cleared / initialized every time CTSOft is started.

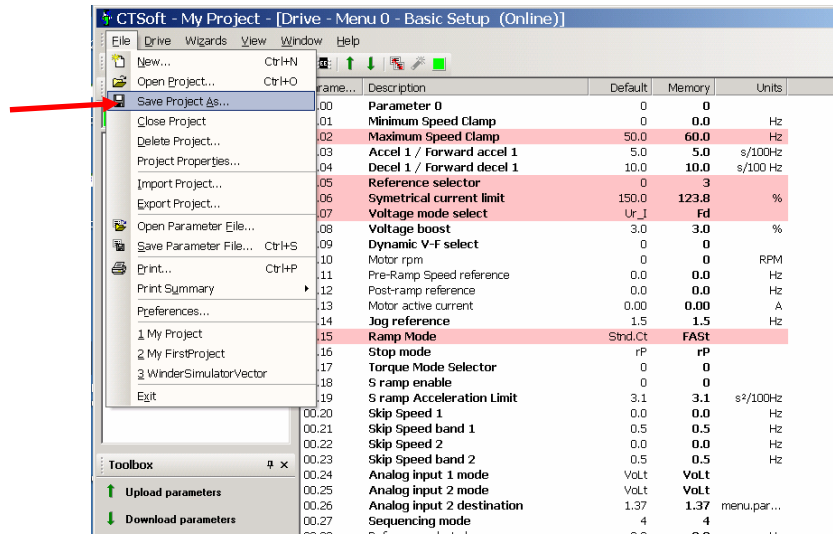
Also note that for a default CTSOft installation, the parameter file is initially saved to “**C:\Program Files\Control Techniques\CTSOft\Project\My Project\ drives\ Drive\ parameter\ <actual parameter file name.prm>**”.

To save the present drive parameter data that was uploaded in the preceding steps, go to and left click on “**File... Save Parameter File... Ctrl +S**”, and type in a File name for the drive data file that makes sense. For example “Pump4” would be a good name. Don’t worry about the extension “.par”. CTSOft will take care of that detail. Then left click on Save.

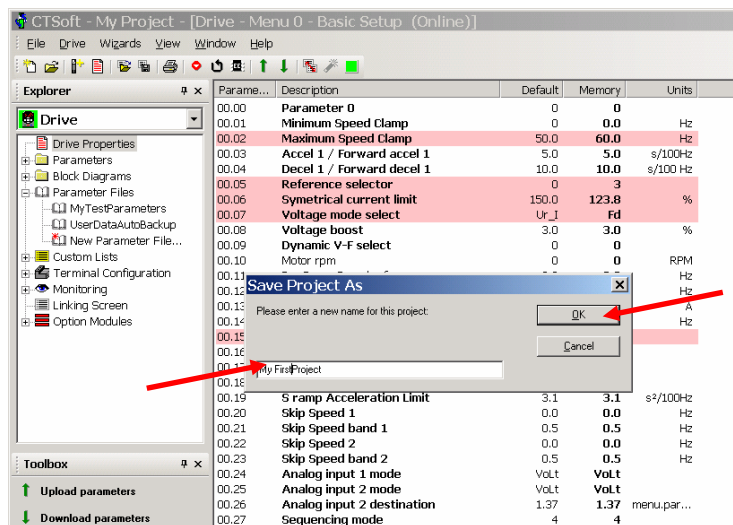


## Saving Drive Parameter data to Disk(continued)

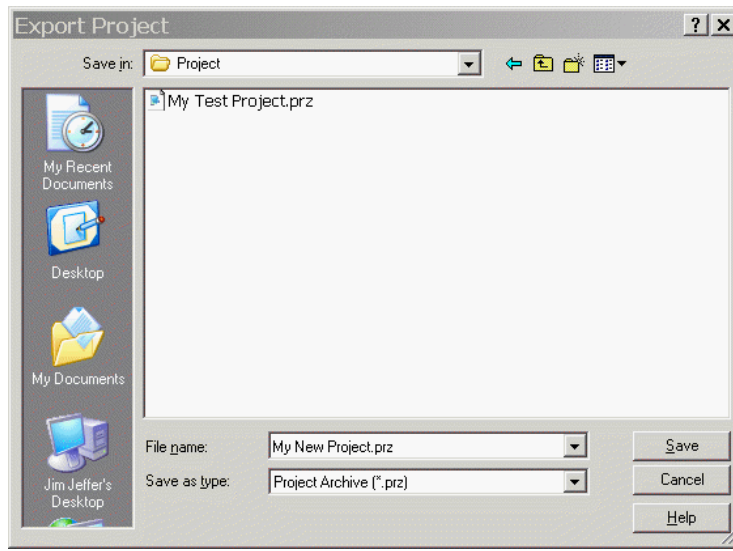
To finish saving the drive parameter data, the project must be saved with a name other than the default “My Project” name. This will copy the entire directory structure from “My Project” to the new folder, where it will **NOT** be cleared the next time CTSofT starts. Select “File... Save Project As...”



Type in a Project name that is descriptive and click on OK.



Finally, it is recommended that the project also be exported to allow easy archiving. Select “File... Export Project...” and browse to the medium to archive the Project. This author favors the use of a USB flash drive for this purpose. Provide a meaningful name and click the Save to complete this operation.



One useful side note about the project file format is that the file is actually in a “zip” format. If one makes a copy of the file and changes the extension to “\*.zip”, the new file can be viewed and “handled” by any program that can handle zip archives, including Win XP’s Window Explorer.

## What do you want to do now?

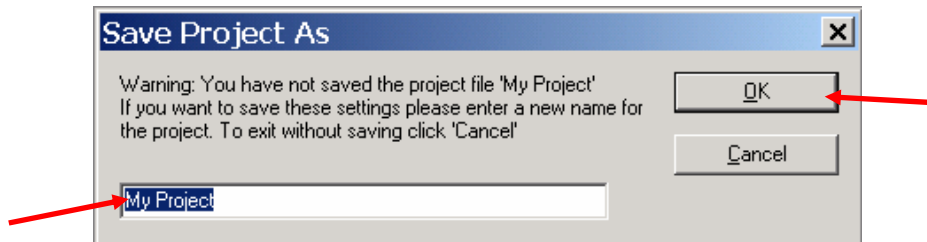
This application note has described so far how to get the parameter data from the drive into CTSOft and save to a parameter file.

The parameter data is still available to load directly into the replacement Unidrive, as long as the reader does not quit CTSOft or does not work with another drive”.

If the reader is **NOT** ready to load parameter directly into the replacement Unidrive, the reader has pulled the parameter data out of the drive and has saved it for a future drive replacement, and is **DONE**.

After your data is saved to disk, remove power from the Drive, wait until it goes dark and fans stop. You may remove the UD71 Communication Module at this time if you wish.

Whenever you attempt to exit CTSOft and have not saved drive parameter data, or have saved it in the “My Project” project (which will be lost next time CTSOft starts), CTSOft will alert the user to a potential data loss and prompt the user to save the Project and drive parameter data by displaying this dialog:



**Last opportunity to get it right**

Type a name that is meaningful and is NOT “MyProject” and click OK to save, Cancel to end CTSOft without anything saved permanently.

After your data is saved to disk, remove power from the Drive, wait until it goes dark and fans stop. You may remove the UD71 Communication Module (if appropriate) at this time if you wish.

If the reader is **IS** ready to load parameter directly into the replacement Unidrive, go “Off-line” in CTSOft, power down the Unidrive to be replaced, install the replacement Unidrive, and continue.

Note that we have just pulled the Drive parameter data into CTSOft and saved it to a parameter file. Unless we quit CTSOft or work with a different drive, this drive parameter data is still available to load from CTSOft into the replacement drive. One can proceed directly to “Getting Data into the Replacement Drive” on page 12.

## **Retrieving the Parameter Data from disk**

There is more than one way to retrieve Drive parameter data with CTSOft, depending on the details how the data was saved to disk. The option to use depends on those details.

If the data is available as a CTSOft Project already present on the PC / laptop being used to restore the data to the replacement drive:

- At the Startup dialog choose “Open a recent project” and select the project. Note that the project containing the drive parameters **is visible** in the text field.
- Click OK to finish selection, and then click OK twice, to dismiss the advice / warning dialogs that follow.
- If more than one drive is present in the project, select the proper drive from the Parameter files under “parameter files” visible in the CTSOft Project Explorer pane.

If the data is available as an exported CTSOft project on removable media (such as a USB Flash drive):

- At the Startup dialog choose “Work with a drive” and insure that the Unidrive is selected. Note that the project containing the drive parameters **is not visible** in the text field.
- Click OK to finish selection, and then click OK twice, to dismiss the advice / warning dialogs that follow.
- Select “File... Import Project...” and browse to the location of the proper file (“\*.prz” extension).
- Click OK to finish selection, and then click OK twice, to dismiss the advice / warning dialogs that follow.
- If more than one drive is present in the project, select the proper drive from the Parameter files under “parameter files” visible in the CTSOft Project Explorer pane.

If the data is available as an isolated CTSOft parameter file on removable media (such as a USB Flash drive):

- At the Startup dialog choose “Work with a drive” and insure that the Unidrive is selected. Note that the project containing the drive parameters **is not visible** in the text field.
- Click OK to finish selection, and then click OK twice, to dismiss the advice / warning dialogs that follow.
- Select “File... Open Parameter file...” and browse to the location of the proper file (“\*.par” extension).
- Click OK to finish selection, and then click OK twice, to dismiss the advice / warning dialogs that follow.

## **Getting Drive parameter data into Replacement Drive**

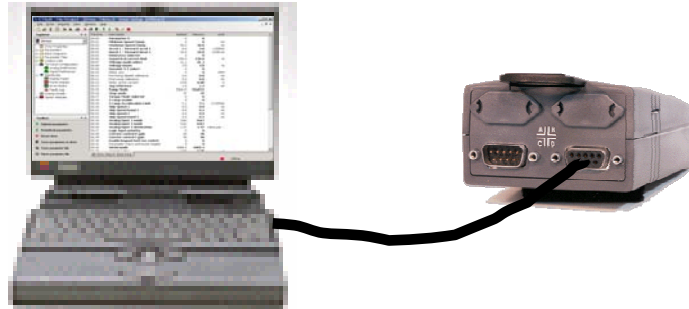
By the time you get to this point, you have either pulled the data to be loaded from the failing replacement drive into CTSOft’s working memory, or you have pulled the data to be loaded from disk into CTSOft’s working memory.

**Note:** If the original drive contained a Small Option Module, that same module or module type must present in the drive during parameter restoration. Otherwise, those parameters governing that module will not be restored !!

Proceed to “**Connecting to the replacement drive using a UD71 and the ANSI protocol**” (for UD71) on page 13” or “**Connecting to the replacement drive using a UD7x and the MD29MON protocol**” (for UD7x) on page 15.

## Connecting to the drive using a UD71 and the ANSI protocol

Plug a straight through RS-232 cable (PN CTD-PC-232-006 (or -010)) into your PC then into port D of the UD71 module. (If a UD7x co-processor module is used, you must use a port C – see next page).



Apply power to the drive, and check and confirm with the Unidrive Keypad that **#11.24** is at “ANSI 4” (1). If not, the original value will need to be noted, and then **#11.24** set to the value “ANSI 4” (1). This would mean that you will need to restore the original value after you’ve completed your communication work with CTSOft.

Inspect and note the value of the following communication setup parameters:

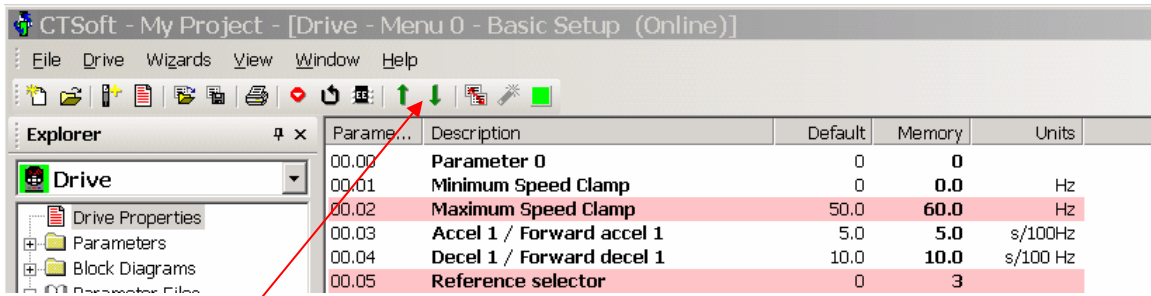
- **#11.23** – default value of 1.1 corresponds to node 11
- **#11.25** – default value of 4800 (0) corresponds to 4800 baud

You will need to match these communication settings in CTSOft to connect to the drive.

Click the “Toggle the On-Line status” menu button (is red at the moment) to go on line and:

- Click the “Change the program to match the drive configuration” at the “Mismatch Detected” dialog.
- If an “Unknown Firmware Version” dialog appears, note the details and click the OK to dismiss the dialog.
- Next, an “Information: Going Online” dialog appears and informs you that an automatic backup has been created. Click OK to dismiss the dialog.
- If a CTSOft dialog appears, note the details and click OK to dismiss.

CTSOft is on line and scanning parameters, and the “Toggle the On-Line status button” is now green.



Click the “Download the parameters to drive” menu button. Note the “Downloading the parameters to the drive” dialog appears, and a confirmation is provided when done. Follow the prompts to reset and save the data in the Drive.

[If you experience communication problems go to page 17](#)

## Skip this page if you are using a UD71 module.

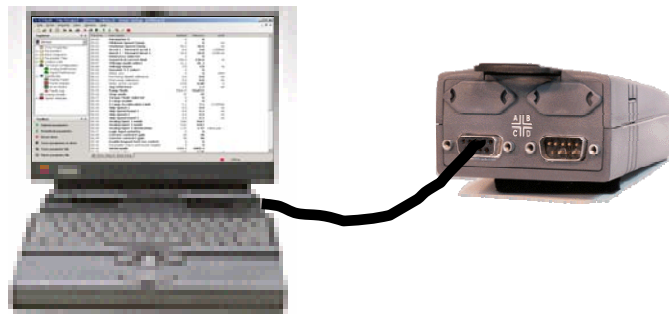
---

### Connecting to the drive using a UD7x and the MD29MON protocol

If a drive contains an UD7x variant which can be:

UD70	Co-Processor without a Fieldbus
UD73	Co-Processor with Profibus
UD74	Co-Processor with InterBus S
UD75	Co-Processor with CT Net
UD76	Co-Processor with Modbus Plus
UD77	Co-Processor with DeviceNet or CANOpen

This implies that you will use the 9 pin female connector on the lower tier port C as shown below using a straight through RS-232 cable (P/N CTD-PC-232-006) coupled to your PC and using the MD29MON communication protocol.



Check and confirm that both **#17.21**, as well as **#17.13** is at a value of zero (0). If they are not, you will need to change these to permit communication and reliable interaction with this module. This would mean that you will need to record these values and they will need to be restored after you've completed your communication work with CTSoft.

If you change **#17.21** or **#17.13** you will need to go to parameter **#0.00** and enter 1070 followed by the RED button. This causes the co-processor to re-read these setup parameters and begin using these communication settings.

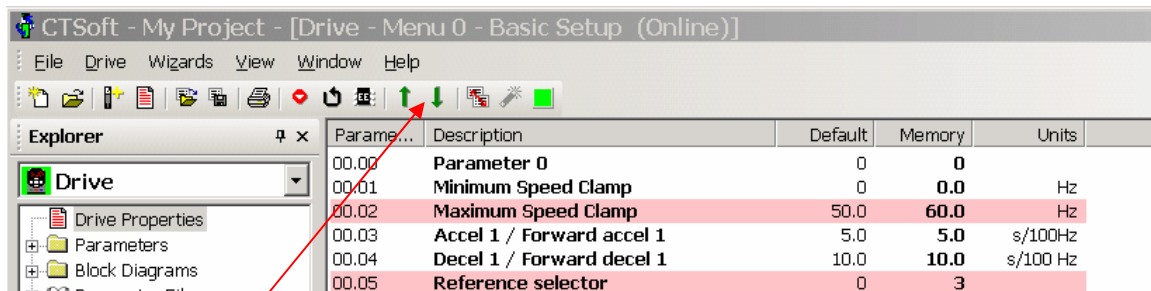
No special communication settings are required for MD29MON protocol, as the node, baud and character framing are fixed.



Click the “Toggle the On-Line status” menu button (is red at the moment) to go on line and:

1. Click the “Change the program to match the drive configuration” at the “Mismatch Detected” dialog.
2. If an “Unknown Firmware Version” dialog appears, note the details and click the OK to dismiss the dialog.
3. Next, an “Information: Going Online” dialog appears and informs you that an automatic backup has been created. Click OK to dismiss the dialog.
4. If a CTSOft dialog appears, note the details and click OK to dismiss.

CTSOft is on line and scanning parameters, and the “Toggle the On-Line status button” is now green.



Click the “Download the parameters to drive” menu button. Note the “Downloading the parameters to the drive” dialog appears, and a confirmation is provided when done. Follow the prompts to reset and save the data in the Drive.

[If you experience communication problems go to page 17](#)

## **Menu 20 Parameters**

Menu 20 parameters are typically used for fieldbus communications purposes. The first twenty parameters and the last two are used to configure and monitor the status of the fieldbus port.

CTSOft can restore values to the Menu 20 parameters when you are connected to the co-processor. However, a standard drive parameter store **does not** store Unidrive menu 20.

After performing a normal drive save you must also perform the Menu 20 Save if Menu 20 is being used. If you are not sure, it would not hurt to perform it anyway.

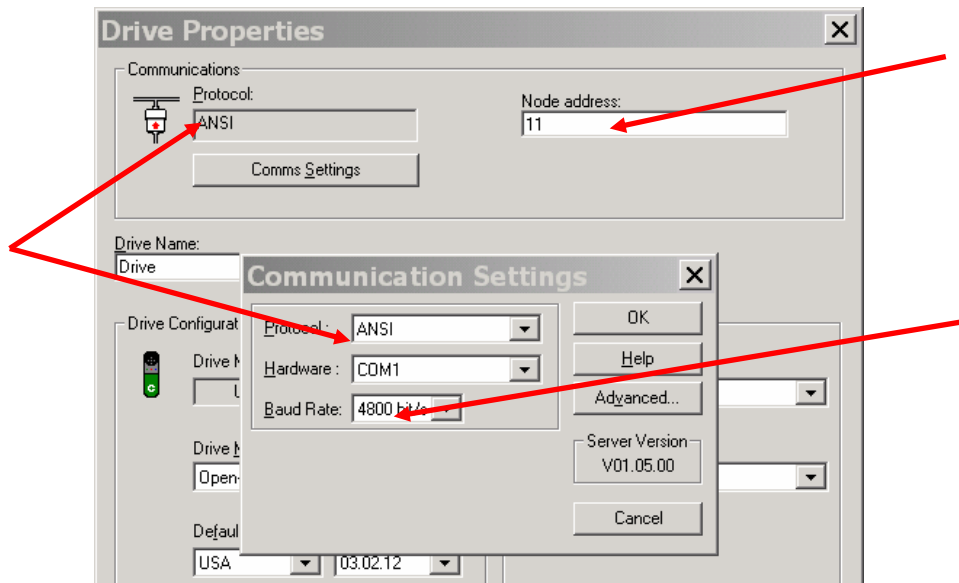
### **Menu 20 Store :**

Storing Menu 20 parameters is accomplished by setting **#17.19=1** then depressing the RED button.

**Note:** A standard drive parameter store **does not** store Unidrive menu 20.

## Failure to Establish Communication

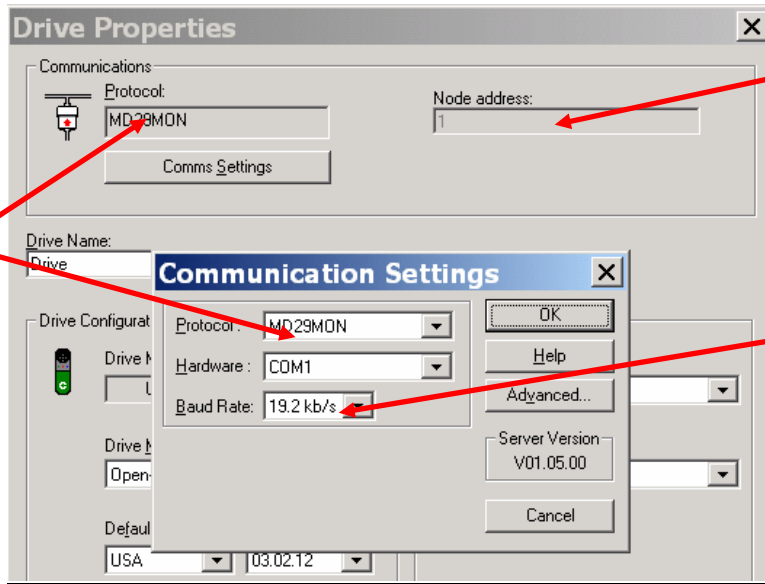
- If a message appears saying the Comm port is being used by another device ensure some other program like RS Logix, RS Linx or Palm pilot sync programs are not active in the Start Menu tray. If they are – close them or shut them down. These programs assume the serial port and prevent CTSOft access.
- Check parameters in the drive for communications are set to match CTSOft (under File/General Setup) and for a functioning UD71 or UD7x



### If UD71 is being used

#11.23 = 1.1 (or 11) Drive address  
#11.24 = ANSI Comm Mode ( ANSI )  
#11.25 = 0 Baud rate (default is 4800 baud)  
#17.13 = 0 reset (to stop user logic)

Cable is CTD-PC-232-xxx



**If UD7X is being used**

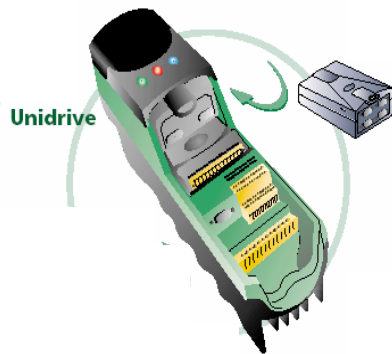
#17.01 = 1            UD70 system is running  
 #17.02 = 262        or greater (307 is current)  
 #17.13 = 0            reset (to stop user logic)  
 #17.21 = 0            MD29MON protocol active

#11.23 = NA           Node address is fixed at 1 for MD29MON protocol  
 #11.25 = NA           Baud rate is fixed at 192 kbs for MD29MON protocol

Cable is CTD-PC-232-xxx



**UD71 Module**  
 RS-232 Port  
 (Female conn )



**UD70 Module**  
 RS-232 Port  
 (Female conn )

**Questions ?? Ask the Author:**

**Author:**            **Jim Jeffers**  
 (716)-774-1193

**e-mail :**            [jim.jeffers@emerson.com](mailto:jim.jeffers@emerson.com)