

The Application Note is pertinent to the Unidrive Classic Family

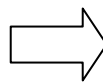
## Unidrive Classic to Unidrive SP Conversion Considerations

### Introduction

Control Techniques introduced the Unidrive Classic around 1993 in Europe and approximately 1995 into the Americas. Because the Unidrive Classic ran simple Open Loop, Closed Loop Vector and Servo motor applications as well as offering a Regen mode, the Unidrive Classic found its way into a great many industrial applications, from simple to quite complex.



**Unidrive Classic Family**



**Unidrive SP Family**

The Unidrive Classic, and its status as a legacy product, is becoming available only in limited quantities and sizes. Control Techniques premier product- the Unidrive SP is a solutions platform that, in most cases, is more than capable of replacing Unidrive Classics in the field, and makes it the logical upgrade path.

This application note will attempt to outline the process when considering upgrades from the Unidrive Classic to the Unidrive SP.

## Considerations

### Can the Unidrive SP replace my Unidrive Classic ?

In most cases the answer would be Yes.

But one should check the dimensions of the Unidrive SP to see if there are any physical conflicts. ***In some cases the replacement model of Unidrive SP may differ in dimensions where there may need to be some panel layout alterations.***

### If after I read this article and determine the Unidrive SP is able to replace my Unidrive Classic, how should I proceed ?

- The best time to plan conversion is before a crisis such as a drive failure. Start by recording all the parameters in the Unidrive. The easiest way to do this is to utilize **UniSoft** ( free from our website at [www.emersonct.com](http://www.emersonct.com) ) as outlined in our Application Note [CTAN182](#). Extract all the data, save it to disk and also create and print out your “**Difference File**”.
- Obtain or create a wiring diagram of what terminals have wires on them and determine their function.
- Obtain pertinent motor nameplate data such as FLA ( full load amps), rated voltage, rated frequency, Power Factor, encoder/resolver information etc.
- Obtain [CTSoft](#) ( setup software for the Unidrive SP- free from our website ) – you will need our CT Comms Cable- consult Sales for 9 Pin D or USB type.
- Create your wiring conversion diagram
- Schedule a downtime period to commence conversion/upgrade.

**Click** on support items listed below for items that are available on our website:

[www.emersonct.com](http://www.emersonct.com)

## Unidrive Transition Guide

[Quick Start Guide](#)  
[Unidrive SP Catalog](#)  
[Unidrive SP Options](#)  
[CTSoft](#)  
[Unidrive SP User Guide](#)  
[Unidrive SP Advanced User Guide](#)

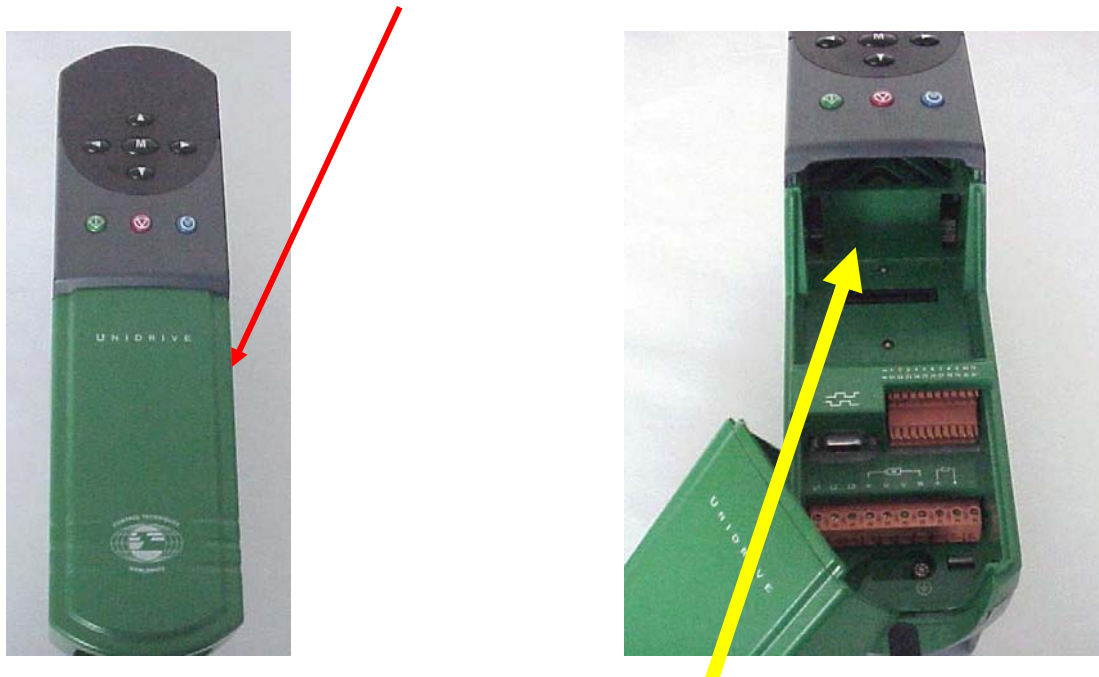
## Can the Unidrive SP replace my Unidrive Classic drive application ?

The answer may be .... It depends.

The concern is primarily whether the Unidrive Classic is employing any special option modules and what those modules were doing.

## Where are these modules and how do I identify them ?

The Unidrive Classic could support up to 2 option modules – 1 Large and 1 Small located under the front cover of the drive.



No option modules  
in this drive !

If you find no option modules under the cover of the drive, the Unidrive SP would make an ideal replacement for the Unidrive Classic. Be sure to **check physical dimensions** however.

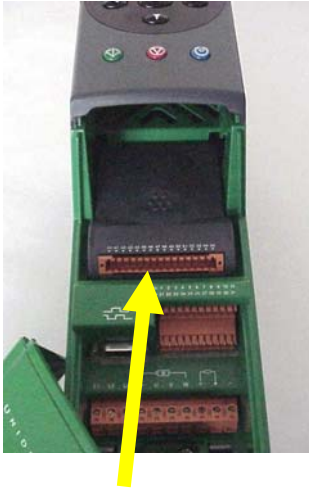
Click below for:

**[Unidrive SP Dimensions](#)**

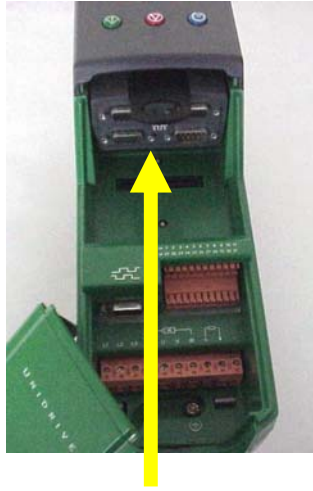
Also consult **[CTAN278](#)** which discusses:

**Converting from Unidrive Classic to Unidrive SP  
The Basics – Terminal Connections and Menu 0**

## Unidrive Classic with Option Modules



With Small Option Module



With Large Option Module



With a Large & Small Option Module

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.



If the Unidrive Classic contains a module, we will need to know which type.



It would be useful to record the **Firmware version** and module **Serial Number**



## Small Option Modules

The UD5x modules can be replaced with comparable option modules available for the Unidrive SP

If the small option module is:



### Unidrive Classic Module



### Unidrive SP Module



---

**UD50** Extended I/O Module  
Used to add more inputs and outputs

**SM-I/O Plus** or possibly **SM-I/O Lite**  
Depending on the quantity and mix of I/O required

---

**UD51** 2<sup>nd</sup> Encoder Module  
Used to follow another motor encoder or frequency, or to send out a Frequency

### **SM- Universal Encoder Plus**



---

**UD52** Sin/Cos Encoder Module  
  
Used for motor position feedback for Absolute position control or very accurate/low speed performance

This can be conditional. If there is no connection to the 15pin D Connector of the UniClassic as shown, then no module is needed. The Sin/Cos Encoder would connect to the UniSP 15 pin D Connector.

**!** If this D connector on the Unidrive Classic is being used ( with the UD52 ) then one would need to employ the **SM- Universal Encoder Plus** to bring in the Sin/Cos encoder information into the Unidrive SP



---

**UD53** Resolver Module  
Used for motors that use a resolver for feedback

### **SM- Resolver**



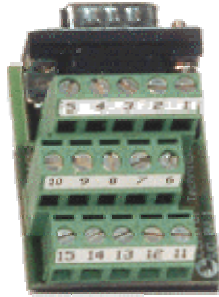
---

**UD55** Cloning Module

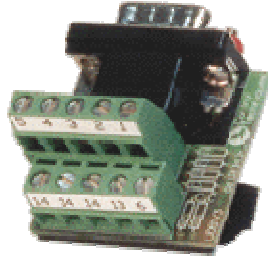
Standard with Unidrive SP  
( Parameters saved on SmartCard )

## Encoder Connection

If the Unidrive Classic had a connection to the 15 pin D connector as shown below, it may have been using either one of the adaptor connectors



15pin D Encoder to TB Board  
**UDBV 1**  
Often used with Servo Motors



9pin D Encoder to TB Board  
**UDBV 3**  
Often used with Vector Motors



The Unidrive SP equivalent of these interface boards would be the **SM-ETC**



## Large Option Modules

Replacement of the Large Option Module (LOM ) functionality can be more problematic.

There were a series of LOM's for the Unidrive Classic, all very similar in look but having different functionality. Most of these modules dealt with some form of Fieldbus communications **but...could also contain a custom program for the application !!!**

The exception is the UD71 module which would not contain a program



UD70 Coprocessor



UD71 RS232 or  
RS485 comms



UD73 Profibus



UD74 InterBus



UD75 CTNet

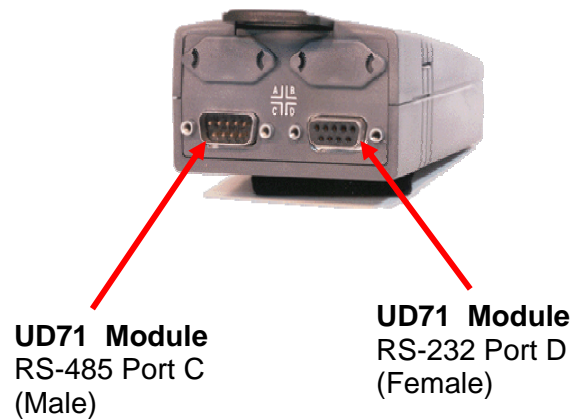


UD77 DeviceNet



**If the Unidrive Classic contained a UD71 and:**

There are no connections to either Port C or D, then you will not need a module for the Unidrive SP. Basic communications is standard on the Unidrive SP.



If the Unidrive Classic contain a UD7x module, you should extract all the parameter data from the Unidrive Classic and Print Out the Difference File as it will prove very helpful in setting up the parameters for the Unidrive SP. To obtain instructions on how to do this, go to **GOOGLE** and search for **CTAN182** or click on the following link [CTAN182](#)

**If the Unidrive Classic contained a UD71 and:**

There is a connection to Port C, then other information will need to be determined. This is the RS-485 port and was typically used to communicate to a PLC or HMI unit of some sort using ANSI communications. This communications could be either 4 wire or 2 wire. One could look at the schematic to determine this or look at the drive parameter settings.

If parameter #11.29 is 3.00 or greater, the communication mode is determined by the value in **#11.24**. Parameter #11.24 is the mode of operation of the serial port. If it is:

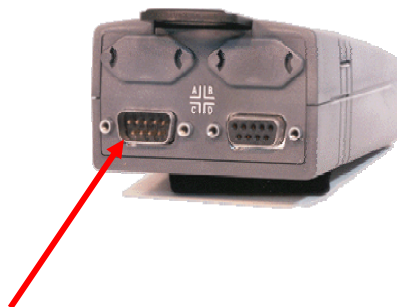
**0**      ANSI 2      ANSI protocol, two wire, half duplex serial communications

Then one should be able to utilize the Unidrive SP standard serial port. However, this port uses an RJ45 connector vs a 9 pin D type. Conversion would be necessary and the Unidrive SP communication mode would need to be set for ANSI ( see parameter 0.35 )

However, if **#11.24** = 1 then it is set to use

**1**      ANSI 4      ANSI protocol, four wire, half duplex serial communications

You would need to specify an SM-Apps module as this module contains an RS-485 4 wire port that can be configured for ANSI.



**UD71 Module**  
RS-485 Port C  
(Male)

If the Unidrive Classic contain a UD7x module, you should extract all the parameter data from the Unidrive Classic and Print Out the Difference File as it will prove very helpful in setting up the parameters for the Unidrive SP. To obtain instructions on how to do this, go to **GOOGLE** and search for **CTAN182** or click on the following link [CTAN182](#)

**If the Unidrive Classic contained a UD71 and:**

If #11.24 = 2 or 3, then this drive uses a special "***Interdrive***" communications mode which **is not implemented with the Unidrive SP.**

- 2**      OUtPUt Output variable defined by 11.27 (CT protocol).
- 3**      INPUt   Input variable to parameter defined by 11.27 (CT protocol)

Modes 2 and 3 are for transfer of a variable from one drive to another. In both cases data is transferred at a rate of at least 140Hz. Although the data rate is slightly slower than that of Mentor II and CDE, the protocol and baud rate are identical and it is possible to connect a Unidrive drive to a Mentor II or CDE for data transfer in either direction.

**In this case the immediate solution would require using a spare Unidrive Classic or have the Unidrive Classic repaired.**

**For Repair or Parts call   1-800-367-8067**

If a Unidrive Classic is not available, a Unidrive SP could be used BUT you would require an SM-Apps Module as the *Interdrive* communication scheme would need to be changed over to utilize CTNet. This would also require all the other Unidrive Classic's on the *Interdrive* network to be fitted with UD75's ( the CTNet version of communication module ) in order to achieve the same functionality.

Often this requires **On-Site Engineering Analysis and Conversion**  
Click the following link for information on this service: [On-Site Services](#)

If the Unidrive Classic contain a UD7x module, you should extract all the parameter data from the Unidrive Classic and Print Out the Difference File as it will prove very helpful in setting up the parameters for the Unidrive SP. To obtain instructions on how to do this, go to **GOOGLE** and search for **CTAN182** or click on the following link [CTAN182](#)

If the Unidrive Classic contains a **UD70 Module**  
and there is a connection to **Port D**:



UD70 Coprocessor

One needs to examine Parameter #17.06 in the Unidrive Classic.

If Parameter **#17.06** is set for **5** and parameters **#17.12 thru #17.18 are set for 0**, then the Unidrive SP should be able to be used without a need for the SM-Apps module. The connection that was on Port D was a **2 Wire RS-485 ANSI** communication link. The Unidrive SP provides a 2 Wire RS-485 communication link as standard. You would need to set the protocol by parameter **#0.35= ANSI**. Physical connection however would need to change from a 9 Pin D connector to use an RJ45 male connector to plug into the front of the Unidrive SP.

Alternatively, one could elect to utilize the SM-Apps module with the Unidrive SP for this serial connection. Connection may prove easier since connections to the RS485 port is achieved via simple wire terminal strip connections on the SM- Apps Module.

---

If Parameter **#17.06** is set for **1** and parameters **#17.12 thru #17.18 are set for 0**, then the Unidrive SP should be able to be used but you would need the SM-Apps module. The connection that was on Port D was a **4 Wire RS-485 ANSI** communication link. The Unidrive SP provides a 2 Wire RS-485 communication link as standard but 4 Wire ANSI can be achieved using the SM-Apps module. Physical connection however would need to change from a 9 Pin D connector since connections to the RS485 port is achieved via simple wire terminal strip connections on the SM-Apps module.

If the Unidrive Classic contains a **UD70 Module**  
and there is a connection to **Port D**:



UD70 Coprocessor

One needs to examine Parameter #17.06

If Parameter #17.06 is a 2,3,4 or 9,10,11,12 then this drive used a special communications mode which **is not implemented with the Unidrive SP.**

**In this case the immediate solution would require using a spare Unidrive Classic or have the Unidrive Classic repaired.**

**For Repair or Replacement Parts call 1-800-367-8067**

If a Unidrive Classic is not available, a Unidrive SP could be used BUT you would require an SM-Apps Module as the *Interdrive* communication scheme would need to be changed over to utilize CTNet. This would also require all the other Unidrive Classic's on the *Interdrive* network to be fitted with UD75's ( the CTNet version of communication module ) in order to achieve the same functionality.

Often this requires **On-Site Engineering Analysis and Conversion**

Click the following link for information on this service: [On-Site Services](#)

If the Unidrive Classic contain a UD7x module, you should extract all the parameter data from the Unidrive Classic and Print Out the Difference File as it will prove very helpful in setting up the parameters for the Unidrive SP. To obtain instructions on how to do this, go to **GOOGLE** and search for **CTAN182** or click on the following link [CTAN182](#) and [CTAN310](#)



## Other UD7x situations

There may be other complications ( such as when these module contain a Custom Application program ) but if one is certain that these modules **DO NOT** contain a Custom Application program then the following would be needed.

A quick indicator to determine if the UD7x module contains an active Application Program would be to examine parameters #17.12 thru #17.18. If any of these are set for other than 0 ( specifically #17.13 =1 ) this tends to indicate that a Customer Application Program exists in this UD7x module !



UD73 Profibus



SM- Profibus Module



UD74 InterBus S



SM- Interbus S Module



UD75 CTNet



SM- Apps Module



UD77 DeviceNet



SM- DeviceNet Module



## **More UD7x Concerns**

Again, if the Unidrive Classic contained a Large Option Module and it was either a :

**UD70 Co-Processor only  
UD73 Profibus  
UD74 Interbus S  
UD75 CTNet  
UD77 DeviceNet**

There is a distinct possibility that it contains a Custom Application Program written in DPL ( Drive Programming Language ) or SyPT ( System Programming Toolkit ) using function blocks, ladder logic and DPL.

**A quick indicator to determine if the UD7x module contains an active Application Program would be to examine parameters #17.12 thru #17.18. If any of these contain a value other than 0 ( specifically #17.13 =1 ), this tends to indicate that a Customer Application Program exists in this UD7x module !**

If this is the case, it will be necessary to examine the “**Source Code**” for that program. It is the responsibility of the OEM, System Integrator or Consulting Firm to leave a copy of that with you after initial commissioning or start-up. Some OEM's may have chosen not to provide the Source Code to the End User's for safety or proprietary reasons. If you wish to replace the drive with a Unidrive SP and utilize their program, you will need the source code.

If you do not possess or cannot obtain the source code from the OEM, System Integrator or Consulting Firm, you may be able to extract it ( UPLOAD ) if it is embedded. To investigate this further click on the following link or key [CTAN219](#) into GOOGLE.

**To obtain the program discussed in App Note CTAN219 click [HERE](#) or Go to [www.emersonct.com](http://www.emersonct.com) Support/Downloads ,Application Notes, Miscellaneous and look under CTAN219.**

This source file will need to be examined in order to confirm that the program can indeed be ported/converted for execution within the SM-Apps Module ( Unidrive SP CoProcessor )

Often this requires **On-Site Engineering Analysis and Conversion**  
Click the following link for information on this service: [On-Site Services](#)

Because of certain features that may have been utilized to achieve a certain functionality in an application, should a Unidrive Classic need replacing, repair may be the most cost effective and timely solution.

The Americas Service Center continues to provide long term product support for the Unidrive Classic, as well as all other legacy products.

**For Repair or Replacement Parts call 1-800-367-8067**

Nov 2006

## Unidrive Classic to Unidrive SP Conversion Worksheet

### Tools

- ☐ Application Note CTAN #277
- ☐ Application Note CTAN #278
- ☐ UniSoft Software
- ☐ Application Note CTAN #182
- ☐ Application Note CTAN #310
- ☐ CTSOFT Software
- ☐ CTComms Cable

### Order Code:

[CTAN277](#)  
[CTAN278](#)  
[UniSoft](#)  
[CTAN182](#)  
[CTAN310](#)  
[CTSOFT](#)  
[CT COMMS CABLE](#)

### Basics

- ☐ Classic Part Number #UNI-\_\_\_\_\_ **SP**\_\_\_\_\_
- ☐ Classic Serial Number #\_\_\_\_\_ ( 10 digits )
- ☐ Physical Dimensions Verified (Classic / SP)
- ☐ Wiring Diagram on Hand
- ☐ Motor Nameplate Data documented
- ☐ Drive Parameters recorded and printed
  
- ☐ No Option Modules used with UniClassic

### Option Modules Used

- ☐ UD73 Profibus Communications (Standard) [SM-PROFIBUS](#)
- ☐ UD74 InterBus S Communications (Standard) [SM-INTERBUS](#)
- ☐ UD75 CNet Communications (Standard) [SM-APPS](#) .
- ☐ UD77 DeviceNet Communications (Standard) [SM-DeviceNET](#)

### Custom Application Program Used

- ☐ Obtain additional information (Source Code) from your OEM, System Integrator, or Consulting Firm
- ☐ See Application Note CTAN #219 or click here [CTAN219](#)
- ☐ Contact your local Control Techniques Applications Engineer 1-800-893-2321
- ☐ On-Site Engineering Analysis & Conversion Services 952-995-8000 ask for Field Services

**Click here for info → [On-Site Services](#)**