

Dio File Guide

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1 Introduction

This document is a guide for proper use of IO's in the .dio file, the advantys system and in the statemachines

2 Dio file

The Dio file is where all the Advantys I/O ports are defined. The file consist of modules that all have a type, a name and some connections. A dio file with one module as an example is seen in figure 1.

```
IOVERSION 1
ipaddr=192.168.0.170
simulate=0
NumOfModules=22
Type=STB3610DDI
Name=1DI6
Connect1="PalletSegment4 palletInPlace"
Connect2="PalletSegment7 palletInPlace"
Connect3="PalletSegment3 palletInPlace"
Connect4="PalletMagazine palletInPlace"
Connect5="PalletSegment3 BoxTest"
Connect6="ConveyorOut Box1"
```

Figure 1: Dio example

2.1 IO Version

This must always be 1.

2.2 IP address

The generally used IP address is 192.168.0.170, but if the robot system has multiple advantys islands, the IP address 192.168.0.171 and 172 can be used.

2.3 Simulation

If a simulation of Advantys is needed the **simulate** value must be set to 1.

2.4 Number of modules

This number is the total number of IO modules, not including the main and power module.

2.5 Type

The **Type** of the modules that can be used in the dio file, can be seen in table 1.

Dio Type	Advantys module	IO type	ports
AVI1270	STBAVI1270K	analog input	2 ports
AVO1250	STBAVO1250K	analog output	2 ports
STB3420DDI or DDI3420	STBDDI3420K	digital input	4 ports
STB3610DDI or DDI3610	STBDDI3610K	digital input	6 ports
STB3725DDI or DDI3725	STBDDI3725KC	digital input	16 ports
STB3600DDO or DDO3600	STBDDO3600K	digital output	6 ports
STB3705DDO or DDO3705	STBDDO3705KC	digital output	16 ports
EPI2145	STBEPI2145K	ethernet	4 ports
EHC3020	STBEHC3020KC	rising/falling edge	1 port

Table 1: Advantys modules

The **Type** can in some cases have two **type** names for the same Advantys module, seen in table 1 above. The preferred **type** is the shortest.

2.6 Name

The **Name** syntax is shown below and the different IO types in table 2.

```
Name=[Number on island][IO type][ports]
Name=1DI6
```

The first digit is the number on the island from left to right. So the first module would have 1 as the first digit, the second module would be 2. The letters in the name explains which IO type the module is. The last digit is how many ports it has.

Dio type	IO type name	ports
AVI1270	AI	2
AVO1250	AO	2
DDI3420	DI	4
DDI3610	DI	6
DDI3725	DI	16
DDO3600	DO	6
DDO3705	DO	16
EPI2145	M	4
EHC3020	C	1

Table 2: Module Name

2.7 Connect

There are different connect types, the InWord, InShort and OutWord, OutShort will not be explained:

- Connect[port number]=
- InConnect[port number]=
- OutConnect[port number]=
- Ready[port number]=
- Tripped[port number]=
- Energized[port number]=
- InWord[port number]=
- InShort[port number]=
- OutWord[port number]=
- OutShort[port number]=

For digital on/off connections, **Connect**, **InConnect** and **OutConnect** are used. **Connect** only works for digital input modules **DDI3420** & **DDI3610**, but all digital output modules and **EPI2145**. **InConnect** works for all digital input modules, and **OutConnect** works for all digital output modules, and **EPI2145**.

Ready, **Tripped** and **Energized** are status information from the connected motors. Only one **Ready**, **Tripped** and **Energized** per motor. Looking at the dio file in figure 2, we can see that even though the module only has 4 ports, the dio file has 8 connections. A motor is connected with two connection, the first for forward and second for reverse movement.

Motor	Connect	Ready, Tripped, Energized
1	1 & 2	1
2	3 & 4	2
3	5 & 6	3
4	7 & 8	4

Table 3: Motor and Connections

As seen in figure 2, all the connections doesn't have to be declared.

```
Type=EPI2145
Name=4M4
Connect1="Pallebanel MotorFwd"
Connect2="Pallebanel MotorRev"
Connect3="PalletSegment1 MotorFwd"
Connect4="PalletSegment1 MotorRev"
Connect5="PalletSegment3 ChainFwd"
Connect6="PalletSegment3 ChainRev"
Connect7="PalletSegment4 ChainFwd"
Connect8=""
Ready1="Pallebanel Ready"
Tripped1="Pallebanel Tripped"
Energized1="Pallebanel Energized"
Ready2="PalletSegment1 Ready"
Tripped2="PalletSegment1 Tripped"
Energized2="PalletSegment1 Energized"
Ready3="PalletSegment3 Chain Ready"
Tripped3="PalletSegment3 Chain Tripped"
Energized3="PalletSegment3 Chain Energized"
Ready4="PalletSegment4 Chain Ready"
Tripped4="PalletSegment4 Chain Tripped"
Energized4="PalletSegment4 Chain Energized"
```

Figure 2: Dio motor module setup

Statemachines can access both the Connect and the status informations, as seen in section 3.

3 Statemachine Input/Output

Input and Output can be used in a statemachine to get access to the dio file.

```
Input=localname "Input name"  
Output=localname "Output name"
```

It is recommended to use this syntax

```
Input=localname "[statemachine name] [localname]"  
Output=localname "[statemachine name] [localname]"
```

An example can be:

```
Input=Box1 "conveyerOut Box1"  
Output=Motor "conveyerOut Motor"
```

By using this syntax it is easy, to see where the input and output is used in the Dio file.