Mul File Specification - ioDef

Specification of the ioDef.mul file

Contents

Function

The ioDef file is used to define which Inputs and Outputs a particular machine has. The IO definitions are used for

- Displaying the IO as panels on the Service screen of the control software for diagnostics
- References in the alarms file for building machine-specific alarm modes
- References in the spindle / tooling setup to define spindle on / off outputs and sensor inputs, etc
- References in the xholds file to define x axis areas where an output cannot function
- References in the axis setup to identify the home input for a particular axis

Each line is an individual input or output

Field Format

Field Specification

No	Name	Format	Notes
1	Code Name	20A	Code name used to reference IO The name needs to be short enough to fit on the IO screen buttons Later software / machines prefixed with InX_ or OuX_ where X is the module letter
2	Ref No	3N	3 digit reference code for the IO. this code is critical as it is used to link everything together. It is a unique code for an input or output function that is used across the range of Stuga machines. See Input Reference Dictionary and Output Reference Dictionary
3	Type	1N	0 - Disabled 1 - Input 2 -Output
4	Node	2N	** Nextmove E100 / ESB systems only - not used on Beckhoff *** This is the CAN Node hardware that the IO is referenced on 0 is the Main Nextmove controller
5	Channel	2N	** Nextmove E100 / ESB systems only - not used on Beckhoff *** The hardware channel on the node that the IO is referenced to ℹ ...On a Beckhoff machine, the IO references are linked to the hardware using the Visual Studio Interface
6	Inverted	Bool	Defines if the input is inverted - the state will be inverse in all calculations. Use with extreme caution

7	Stoppable	Bool	Defines if an output should "Pause" during and alarm and then back on again after a restart. Outputs such as conveyor belts and blowers should pause when an alarm occurs, then restart once start is pressed Other outputs such as clamps need to stay on to hold the position during an alarm
8	Column	2N	Column / screen that the IO reference will appear on the service screen. See below
9	Row	2N	Row that the IO appears on
10	Keypress	1A	Shortcut Key on keyboard that will toggle the output on and off is press while service screen is active
11	Log	Bool	*** DO NOT USE ***
12	Location	1N	Location of the output on a flowline style machine that has 2 sides 0 - All sides (default) 1 - MH side only 2 - Saw side only ...This value is important for the stoppable output function. If one side of the machine is paused due to an alarm, you do not want the other side to pause at the same time (it needs to continue running)
13	Cable Ref	5A	If a value is entered in this field, this will change the service screen display to this text. this allows legacy older machines with different cable numbering (Y1, X2, etc) to maintain the correct numbers on screen, but have a the standard IO reference in the background ...Can also be used to identify a component (eg a cylinder)
14	Disabled	Bool	Disable Input Channel (see Disable IO channel)
15	Timeout	4N	Timeout in milliseconds to use if this input is disabled (see Disable IO channel)
16	Compliment	20A	Name of the IO ref that forms the compliment to a Solenoid / Solenoid operated valve. See Cyclical Control of Outputs to Aid Cylinder Speed Setup

Column Numbering

The columns are given a code number to identify both the column number on the screen and the screen that they appear on

Range	IO Screen	Notes
0-5	Main Service Screen (IO)	On this original screen, the inputs and outputs are fixed on the left and right side of this screen, so the location is also determined by whether it is an input or an output The number relates to the column
10-19	Spindle IO	The digit after the 1 relates to the column on the spindle IO screen
20-29	IO- Infeed	The digit after the 2 relates to the column on the IO-Infeed screen
50-59	IO-Saw	The digit after the 5 relates to the column on the IO-Saw screen
60-69	IO-TransferTbl	The digit after the 6 relates to the column on the IO-TransferTbl screen

...If you accidentally put one reference on top of another, there is not warning for this, so care should be taken that each reference has a unique column and row

Sample

```
OuA_VorBack,251,2,0,0,0,0,20,1,-1,0,1,Y251/Z01G,0,0,OuA_VorFwd
InA_VorBack,251,1,0,0,0,0,21,1,-1,0,1,X251/Z01G,0,0
OuA_VorFwd,252,2,0,0,0,0,22,1,-1,0,1,Y252/Z01G,0,0,OuA_VorBack
InA_VorFwd,252,1,0,0,1,0,23,1,-1,0,1,X252/Z01G,0,0
OuA_VorUp,253,2,0,0,0,0,20,2,-1,0,1,Y253/Z02G,0,0,OuA_VorDn
InA_VorUp,253,1,0,0,0,0,21,2,-1,0,1,X253/Z02G,0,0
OuA_VorDn,254,2,0,0,0,0,22,2,-1,0,1,Y254/Z02G,0,0,OuA_VorUp
InA_VorDn,254,1,0,0,0,0,23,2,-1,0,1,X254/Z02G,0,0
OuA_GLOff,256,2,0,0,0,0,20,3,-1,0,1,Y256/Z04G,0,0,OuA_GLGrip
InA_GLOff,256,1,0,0,0,0,21,3,-1,0,1,X256/Z04G,0,0
OuA_GLGrip,255,2,0,0,0,0,22,3,-1,0,1,Y255/Z04G,0,0,OuA_GLOff
InA_GLGrip,255,1,0,0,0,0,23,3,-1,0,1,X255/Z04G,0,0
```

OuA_GSOff,257,2,0,0,0,0,20,4,-1,0,1,Y257/Z05G,0,0,OuA_GSGrip
InA_GSOff,1,1,0,0,0,0,21,4,-1,0,1,X001/Z05G,0,0
OuA_GSGrip,1,2,0,0,0,0,22,4,-1,0,1,Y001/Z05G,0,0,OuA_GSOff
InA_GSGrip,257,1,0,0,0,0,23,4,-1,0,1,X257/Z05G,0,0
OuA_Turn0,258,2,0,0,0,0,20,5,-1,0,1,Y258/Z06G,0,0,OuA_Turn90
InA_Turn0,258,1,0,0,0,0,21,5,-1,0,1,X258/Z06G,0,0
OuA_Turn90,21,2,0,0,0,0,22,5,-1,0,1,Y021/Z06G,0,0,OuA_Turn0
InA_Turn90,267,1,0,0,0,0,23,5,-1,0,1,X267/Z06G,0,0
OuA_LiftUp,259,2,0,0,0,0,20,6,-1,0,1,Y259/Z08A,0,0,OuA_LiftDn
InA_LiftUp,396,1,0,0,0,0,21,6,-1,0,1,X396/Z08A,0,0
OuA_LiftDn,260,2,0,0,0,0,22,6,-1,0,1,Y260/Z08A,0,0,OuA_LiftUp
InA_LiftDn,397,1,0,0,0,0,23,6,-1,0,1,X397/Z08A,0,0
InA_MatlLoaded1,31,1,0,0,False,False,3,1,-,False,0,X22,False,-1
InA_MatlLoaded2,32,0,0,0,False,False,0,2,-,False,0,32,False,-1
InA_AirOk,43,1,0,0,False,False,0,1,-,False,0,X18,False,-1
InA_EStop,45,1,0,0,False,False,0,2,-,False,0,X10,False,-1
InA_ButReset,48,0,0,0,False,False,1,1,-,False,0,X48,False,-1
InA_ButESConsole,49,0,0,0,False,False,0,6,-,False,0,49,False,-1
InF_EjectHm,141,1,0,0,False,False,3,2,-,False,0,X26,False,-1
InF_EjectOu,142,1,0,0,False,False,3,3,-,False,0,X28,False,-1
InF_SawOvl,150,0,0,0,False,False,2,4,-,False,0,150,False,-1
InA_ExtrOvl,151,0,0,0,False,False,0,7,-,False,0,151,False,-1
InF_ConvOvlOk,152,0,0,0,False,False,2,5,-,False,0,152,False,-1
InA_ButESMid,162,0,0,0,False,False,0,8,-,False,0,162,False,-1
InA_ButESFront,163,0,0,0,False,False,0,9,-,False,0,163,False,-1
InF_GuardFront,170,0,0,0,False,False,2,7,-,False,0,170,False,-1
InF_GuardTop,171,0,0,0,False,False,2,8,-,False,0,171,False,-1
InF_GateHm,189,0,0,0,False,False,3,6,-,False,0,189,False,-1
InF_GateOu,190,0,0,0,False,False,3,7,-,False,0,190,False,-1
InA_ButESRear,174,0,0,0,False,False,1,1,-,False,0,174,False,-1
InA_AutoSaw,201,1,0,0,False,False,1,1,-,False,0,X4,False,-1
InF_CentHome,203,1,0,0,False,False,3,4,-,False,0,X6,False,-1
InA_StopSaw,204,1,0,0,False,False,1,2,-,False,0,X8,False,-1
InA_StartSaw,205,1,0,0,False,False,1,3,-,False,0,X12,False,-1
InF_SawCutHm,208,1,0,0,False,False,3,5,-,False,0,X30,False,-1
InF_SawCutOut,209,1,0,0,False,False,3,6,-,False,0,X32,False,-1
InF_SCOutMid,269,0,0,0,False,False,3,4,-,False,0,269,False,-1
InA_DatumSaw,225,1,0,0,False,False,3,9,-,False,0,44,False,-1
InA_NextBarOut,268,1,0,0,False,False,3,10,-,False,0,X20,False,-1
OuF_ClampIT,80,2,0,0,False,False,1,1,-,False,0,Y32,False,-1
OuF_ClampOT,82,2,0,0,False,False,1,2,-,False,0,Y26,False,-1
OuF_EjectPush,87,2,0,0,False,False,1,3,-,False,0,Y28,False,-1
OuF_Conveyor,90,0,0,0,False,True,1,4,-,False,0,Y90,False,-1
OuF_Eject,91,2,0,0,False,False,1,4,-,False,0,Y14,False,-1
OuF_Siren,94,2,0,0,False,False,1,5,-,False,0,Y44,False,-1
OuF_Gate,95,0,0,0,False,False,1,7,-,False,0,Y95,False,-1
OuF_SawOn,97,2,0,0,False,True,1,6,-,False,0,Y2,False,-1
OuA_ExtractOn,98,0,0,0,False,True,0,1,-,False,0,Y98,False,-1
OuF_DoorOpen,200,2,0,0,False,False,3,6,-,False,0,Y4,False,-1
OuF_ClampS,202,2,0,0,False,False,1,7,-,False,0,Y6,False,-1
OuF_ClampPos,204,2,0,0,False,False,1,8,-,False,0,Y10,False,-1
OuF_ClampCen,206,2,0,0,False,False,1,9,-,False,0,Y16,False,-1
OuF_SawCut,207,2,0,0,False,True,1,10,-,False,0,Y18,False,-1
OuF_ClampSPos,211,0,0,0,False,False,2,7,-,False,0,Y10,False,-1
OuF_ClampITHi,212,2,0,0,False,False,1,11,-,False,0,Y34,False,-1
OuF_Blow,213,2,0,0,False,False,3,4,-,False,0,Y36,False,-1
OuA_NextBar,250,2,0,0,False,False,0,1,-,False,0,Y24,False,-1
OuA_InfeedLift,267,2,0,0,False,False,0,2,-,False,0,Y38,False,-1
OuA_LoadClear,203,2,0,0,False,False,0,5,-,False,0,Y8,False,-1
InF_Saw45,191,1,0,0,False,False,3,7,-,False,0,X14,False,-1
InF_Saw90,192,1,0,0,False,False,3,8,-,False,0,X24,False,-1
InF_Saw135,197,1,0,0,False,False,3,9,-,False,0,X197,True,-1
InF_Guard,196,1,0,0,False,False,0,3,-,False,0,X16,False,-1
OuF_Saw90,208,2,0,0,False,False,2,1,-,False,0,Y20,False,-1
OuF_Saw135,209,2,0,0,False,False,2,2,-,False,0,Y22,False,-1
OuF_Zsupport,210,2,0,0,False,False,3,1,-,False,0,Y30,False,-1
OuF_Zturret,214,2,0,0,False,False,3,2,-,False,0,Y40,False,-1
OuA_PopUp,5,2,0,0,False,False,0,3,-,False,0,Y46,False,-1
OuA_PopUpPush,13,2,0,0,False,False,0,4,-,False,0,Y42,False,-1
InF_ZTurretA,210,1,0,0,False,False,4,1,-,False,0,X34,False,-1
InF_ZTurretB,220,1,0,0,False,False,4,2,-,False,0,X36,False,-1