ACCUBLAST programmable coolant nozzle

USER MANUAL

BETZ TECHNIK INDUSTRIES LTD.

www.BETZTECHNIK.ca

BTI Ltd.

Contents

SPECIFICATIONS

Specification	Conditions	Notes
Power input voltage	12- 24VDC	
Power consumption	< 2A @ 24VDC	
Maximum coolant pressure	200 PSI	Tested to 100 PSI unless requested
Maximum tool memory	200 tools	
Range of motion	Approximately 180 degrees	-90 to +90 on the display
Input pin voltage	12 – 24VDC	
Input pin amperage draw	< 30mA	The pin will draw this current
Temperature range	5c – 40c	
Coolant connection	3/8” NPT	
Display cable length	18’	
Servo cable length	18’	

APPROVALS

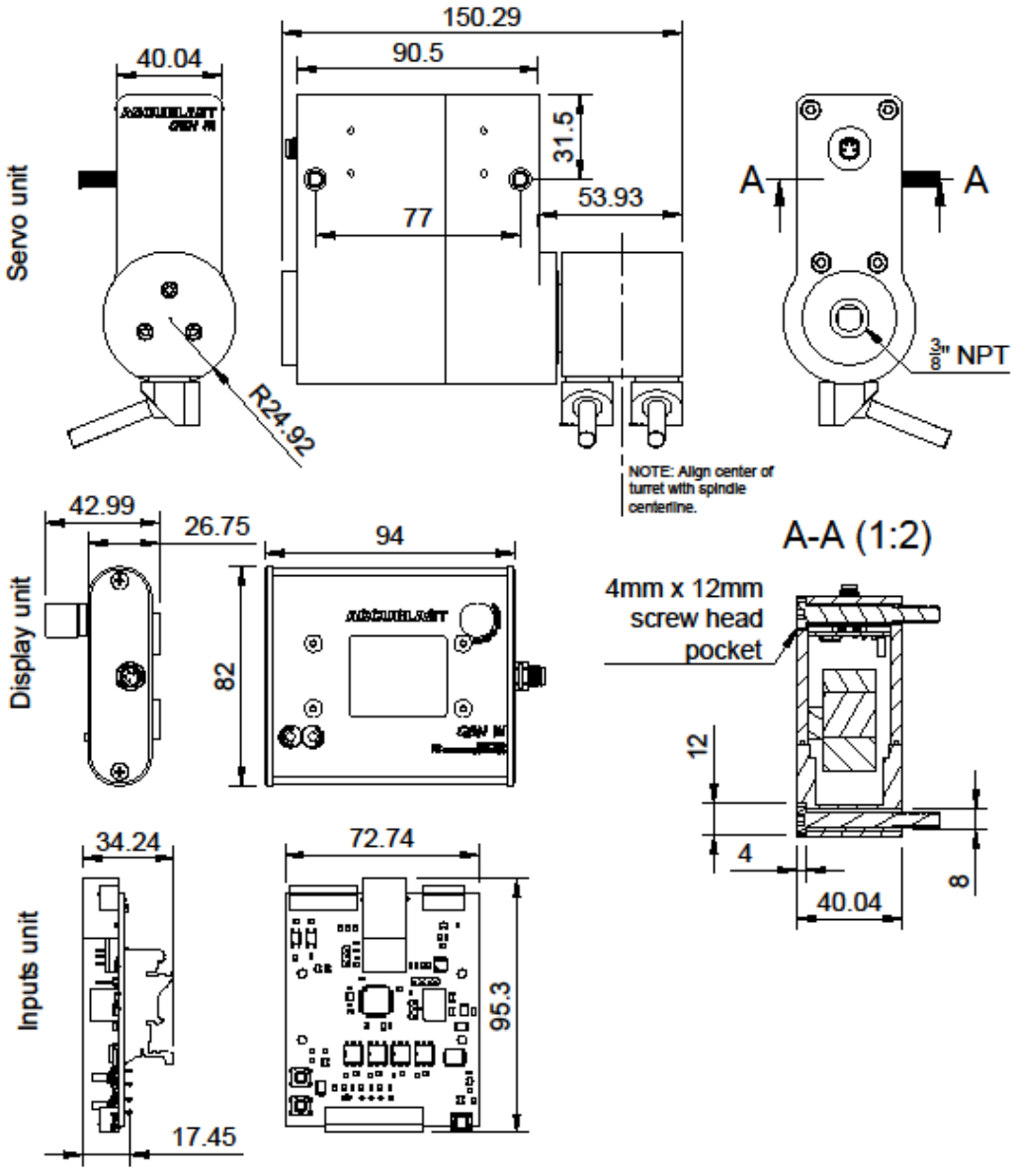
This system is FCC and CAN ICES3(A) /NMB3(A) approved.

KIT CONTENTS

QTY	IMAGE	DESCRIPTION	NOTES
1		User interface (display module)	Magnets on back for mounting.
1		Machine interface (inputs unit)	Din rail mounts.
1 or 2		Servo unit	2 if Dual kit ordered
1		Right angle 4 pin cable	Servo unit to inputs unit
1		Straight 4 pin cable	Display to inputs unit
1 or 2		Turret jet nozzles	Depending on order options

DIMENSIONS AND MOUNTING

Dimensions in mm



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BTI Ltd.		Document type	Document status: R1
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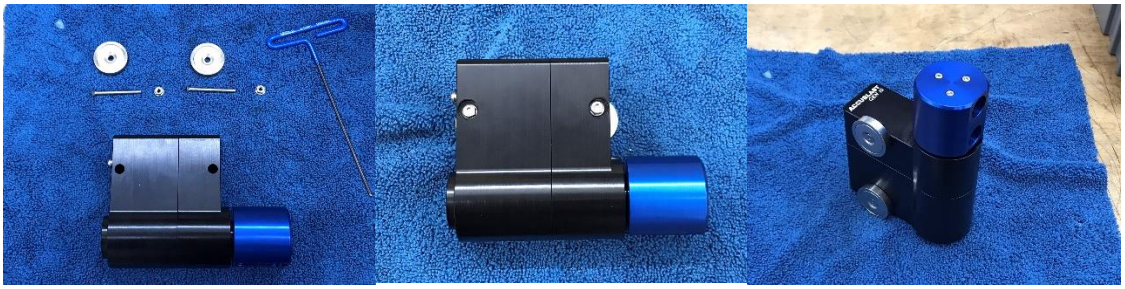
INSTALLATION

Servo unit installation

The Servo unit can be bolted to the CNC machine tool's head using 6mm or ¼" screws. Please consult the dimensional drawing for hole location and spacing. (Bolts not supplied)

Additionally, you can mount magnets on the servo unit by using countersunk magnets and countersunk screws as seen below (not supplied):



Please try and align center of the turret with the spindle centerline as close as possible. If the turret is not perpendicular, and centered in Y, to the spindle centerline, the nozzles will not track perfectly up and down the spindle Z axis as the turret rotates.

The Servo unit can be installed with either face against the CNC machine tool, to allow for more flexibility in mounting. This is why the turret jets are not pre-installed (because they can point to one side or the other depending on your needs). You may need to use thread sealant when installing the turret jets, please use low torque as they are acetal plastic.

The 4 pin connector at the rear is for the right angle display cable that connects the servo unit to the inputs unit.

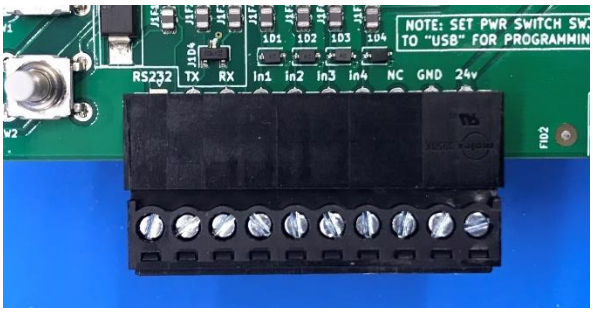
Display unit installation

The display unit is equipped with 4 magnets on the rear for simple mounting.

Inputs unit installation

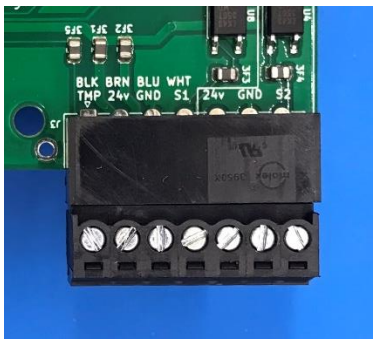
Please ensure the wiring to the unit is sized for the expected current (@ 2A max). You should also provide some sort of fused power supply to protect the supply from unexpected electrical issues. This protection should be rated for 4 or 5 amps.

The inputs unit is designed to be mounted in the machine tool electrical cabinet and is supplied with DIN rail mounts.



PIN LABEL	PURPOSE
RS232	Connect the RS232 TX wire to this pin
TX	TTL MCU TX pin (not currently used) (future use to connect to TTL to RS232 adapter for RS232 out
RX	TTL MCU RX pin, this pin can be used to send the same information that you send to the RS232 pin, but at TTL voltage levels (3.3v max)
IN1	OPTOISOLATED MULTIPURPOSE INPUT function dependant on settings. 24vdc max and will draw @ 30mA
IN2	OPTOISOLATED MULTIPURPOSE INPUT function dependant on settings. 24vdc max and will draw @ 30mA
IN3	OPTOISOLATED MULTIPURPOSE INPUT function dependant on settings. 24vdc max and will draw @ 30mA
IN4	OPTOISOLATED MULTIPURPOSE INPUT function dependant on settings. 24vdc max and will draw @ 30mA
NC	No connection
GND	Ground connection. (should share ground connection with the power supply and also the source of the input connections (IN1- IN4)).
24V	Power input. 12- 24VDC. < 2A draw @ 24v.

PIN LABEL	PURPOSE
BRN	BROWN wire of display cable
WHT	WHITE wire of the display cable
BLK	BLACK wire of the display cable
BLU	BLUE wire of the display cable



* NOTE: Black wire of servo #2 will remain unconnected.

PIN LABEL	PURPOSE
TMP	BLACK wire of servo cable
24v	BRN wire of the servo cable
GND	BLUE wire of the servo cable
S1	WHITE wire of the servo cable
24v	OPTIONAL BRN wire of the #2 servo cable
GND	OPTIONAL BLUE wire of the #2 servo cable
S2	OPTIONAL WHITE wire of the #2 servo cable

OPERATION

User interface general operation

When the system starts, it will be on the main operation screen of the device. Here you can see the current tool number (1 – 200), current nozzle position (in degrees, -90 to +90) and the current twitch setting (TW1- TW3, CLN (twitch is covered below)).

To scroll through the tool, position and twitch settings, simply press down on the encoder knob and you will cycle through the input fields. The current selection is identified by a dark blue background and rotating the knob clockwise or counter clockwise will adjust the value.

TOOL NO. will set which tool's position and twitch information is being recalled. When you are on a particular tool, any changes to the position or twitch settings are automatically stored in memory for that tool.

TWITCH is a function that oscillates the turret up and down on the tool. This function is useful for sweeping long drills and taps. Continuous use of twitch should be avoided, as well as use of twitch when the coolant pump is not running. Therefore the "twitch pause" (TWP) function is recommended and is covered later in the manual. TW1- 3 can be selected, and their range of motion can be adjusted in the settings menu. CLN setting is useful for cleaning off the bed, you can select CLN during the machine tool warm-up cycle.

RESET BUTTON: To reset the user interface, press the reset button.

NOTE: that in order to reset the whole system, the inputs board will also need to be reset or have power cycled to both units. When resetting the units manually, be sure to reset the display unit AFTER resetting the inputs unit or proper operation will not be possible.

SETTINGS BUTTON: Pressing this button will scroll through the other screens in the system which are covered later in the manual. Continuing to press the settings button will eventually take you back to the main operation screen.

Manual mode

In manual mode, the unit can remotely direct the coolant stream using the knob on the display. The unit can still store the desired position for up to 200 tools, as you can manually change the tool number at the display. When you manually change the tool number, it will recall the position and twitch settings for the new tool.

Auto mode

Auto mode allows the Accublast to automatically detect what tool is in the machine tool spindle and recall the saved position and twitch setting for that tool. Auto mode is enabled by selecting an auto mode type in the settings screen. Auto modes are covered later in the manual; however, they are machine tool specific and not all machines are covered.

Settings screen

Pressing the settings button once will load the main settings screen as seen below. Pressing down on the encoder knob allows you to scroll through the various settings.

AUTO MODE: Use this to set the desired auto mode.

1. **OFF**- Auto mode if off and the unit can be used manually. **This setting will also allow the RS232 auto system to operate** (Tormach, Fadal Calmotion). Please see the RS232 integration guide in the customer area of the website (login required).
2. **X7A**- 12 tool magazine monitoring for Syil X7s with Siemens or LNC controls. Please see the X7 integration guide in the integration area of the website (login required).
3. **PUL**- Pulse auto mode for Siemens and Mazak control systems (macro required). Pulse wire needs to be 12 – 24vdc and connected to the IN1 pin. Active high (+). Please see the PULSE integration guide in the integration area of the website (login required).
4. **NGC**- Haas NGC (requires Accublast ethernet option) (macro required). Please see the HAAS integration guide in the integration area of the website (login required).
5. **MDC**- Haas NGC (requires Accublast ethernet option) (macro not required as the Haas machine data collection system is used. Please see the HAAS integration guide in the integration area of the website (login required).
6. **FAD**- Fadal ATC monitoring. CW, CCW and INDEX connections are required on PINS IN1- IN3. Refer to the machine specific integration guide. Please see the FADAL integration guide in the customer area of the website (login required).

IN4 mode: This mode sets the behaviour of the inputs board IN4 pin.

1. OFF- IN4 is not monitored
2. TWP- Twitch pause mode. If you activate this setting you need to supply a 12- 24vdc signal from the coolant pump to IN4. The pin should be driven high (+) when the coolant pump is on. This will pause the twitch motion on the servo unit when the coolant pump is not running. **This configuration is highly recommended for the life of your servo unit**.

Num Nozle: [1,2] If you have dual servo units (Dual kit), then set this to 2 to enable the second servo unit.

Num Tools: [1 – 200] Set the number of tools to keep track of. If your machine tool has an umbrella ATC and you are using ATC monitoring (CW, CCW and INDEX connections) then you must ensure this setting matches the number of tools in the carrousel.

N2 sync: [OFF, ON] If you have dual servo units, you can use this setting to slave the N2 nozzle to the N1 position controls. When this setting is on and you are on N1, and change the position of the nozzle, N2 will also move the same amount. You can set an offset between N1 and N2 and when you activate sync it will maintain that offset.

N1 DIR: [NOR, REV] Use this setting to control which direction the N1 turret rotates in relation to the encoder knob on the user interface (normal or reverse).

N2 DIR: [NOR, REV] Use this setting to control which direction the N2 turret rotates in relation to the encoder knob on the user interface (normal or reverse).

PRO/ BASIC: [PRO, BAS] Use this setting to match which kit you have. Pro kits have an inputs board, and Basic kits do not, and all wiring connections are made at the display unit.

TW1 AMT: [1-30] (degrees) Use this setting to adjust how far the nozzles sweeps when set to TW1.

TW2 AMT: [1-30] (degrees) Use this setting to adjust how far the nozzles sweeps when set to TW2.

TW2 AMT: [1-30] (degrees) Use this setting to adjust how far the nozzles sweeps when set to TW3.

CLN MIN: [-90 – 90] (degrees) Use this setting to set the minimum stop for the nozzle sweep when twitch is set to CLN. CLN is a bed cleaning mode that is useful to help clean off the machine tool bed, best run during a machine warm up program.

CLN MAX: [-90 – 90] (degrees) Use this setting to set the maximum stop for the nozzle sweep when twitch is set to CLN. CLN MIN and CLN MAX determine the range of sweep during CLN.

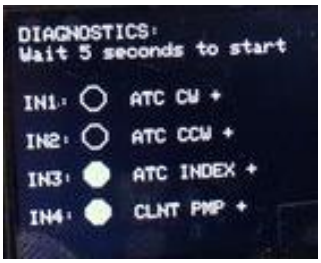
Ethernet settings screen

Depending on options and software this screen may appear after the main settings screen. If you purchased the ethernet module this is where you apply the ethernet settings. Please see the Haas integration guide on the integrations page of the website. www.betztechnik.ca

Diagnostics screen

This screen assists in diagnosing issues and accomplishing integration.

You need to wait for 5 seconds on this screen for the system to switch to diagnostic mode. When diagnostic mode activates, you will see the current status of the inputs (IN1 – IN4). When the circle is black (as seen above), the input is detecting a LOW signal, then the circle is green, it is detecting HIGH. Depending on what options you have selected in the main settings screen, you may also see labels to the right of each pin indicator. This is identifying what signal the system is expecting to see based on your current settings (specifically AUTO mode and IN4 mode). The example below shows the diagnostic screen when the system is set to **FAD** auto mode, and **TWP** IN4 mode. (the '+' denotes active high).



Please note that some unusual behavior may occur when the unit is in diagnostics mode (missed tool changes, etc.).

FIRMWARE UPDATING

From time to time, we refine the firmware to fix bugs or enhance functionality. The system is capable of being programmed in the field. Please see the website for programming instructions.
www.betztechnik.ca