

A business of BARNES GROUP INC

KIT-TM-V USER MANUAL

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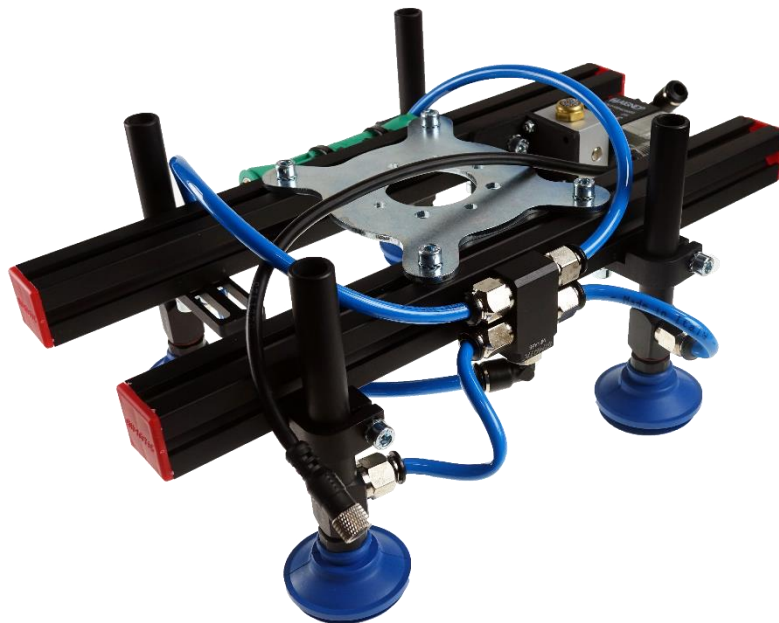
1. INTRODUCTION

The KIT-TM-V is an End Of the Arm Tool (EOAT) for pick & place applications which exploits the vacuum technique and it is designed for Techman Robot cobots (TM5, TM12 and TM14 series). This kit is completely compatible with Gimatic KIT-TM-EQC20 kit and it can be used in combination with any collaborative robot that provides a limited power supply capability at the wrist.

The “Gripper Gimatic KITV” software package has three components: Set, Grip and Release.

These components allow the user to configure and operate the robot with a list of work items (8 at most) and to easily perform two tasks: GRIP (for taking a specific work item) and RELEASE (for releasing a specific work item).

This operating manual describes how to import, setup and use these components.



2. IMPORTING THE COMPONENTS

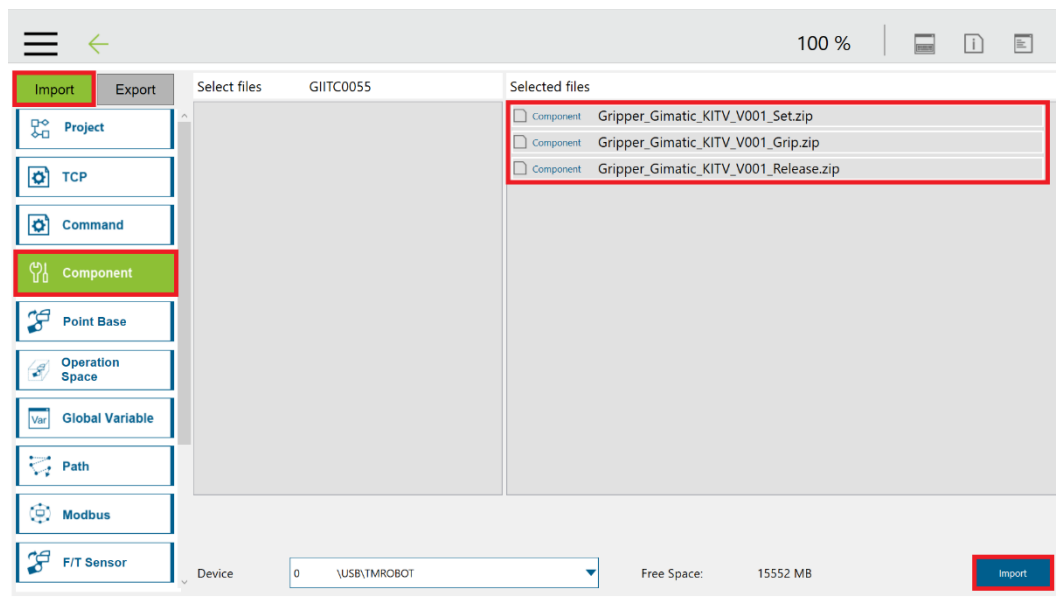
The component can be downloaded from: shop.gimatic.com/en/tm

Copy the folder “TM_Export” to an USB pen and set the name of the pen drive to match the following name: “TMROBOT”. Insert it in the appropriate port on the robot controller.

In the TMflow menu, navigate to System, Import/Export to import the components on TM controller and to make them available in the TMflow.

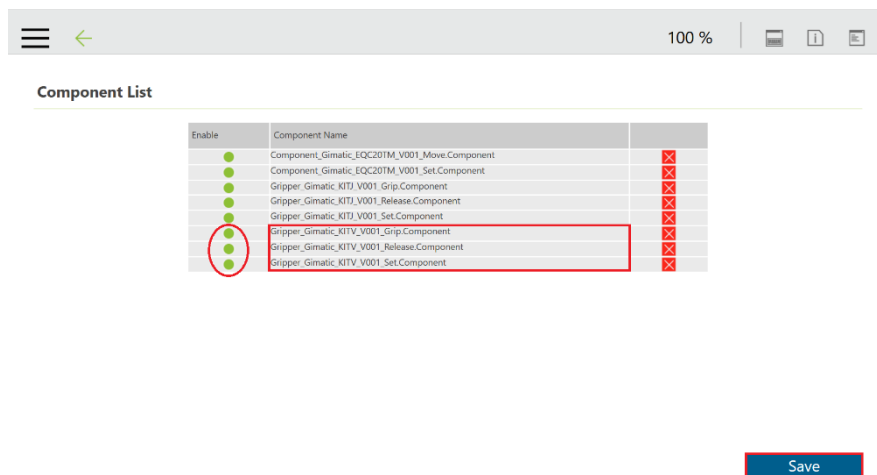
Click the “Import” button and select “TMComponent” on Robot List.

Select “Component” on the leftside menu and choose the components to import, in this case “Gripper_Gimatic_KITV_V002_Set.zip”, “Gripper_Gimatic_KITV_V001_Grip.zip” and “Gripper_Gimatic_KITV_V001_Release.zip”.



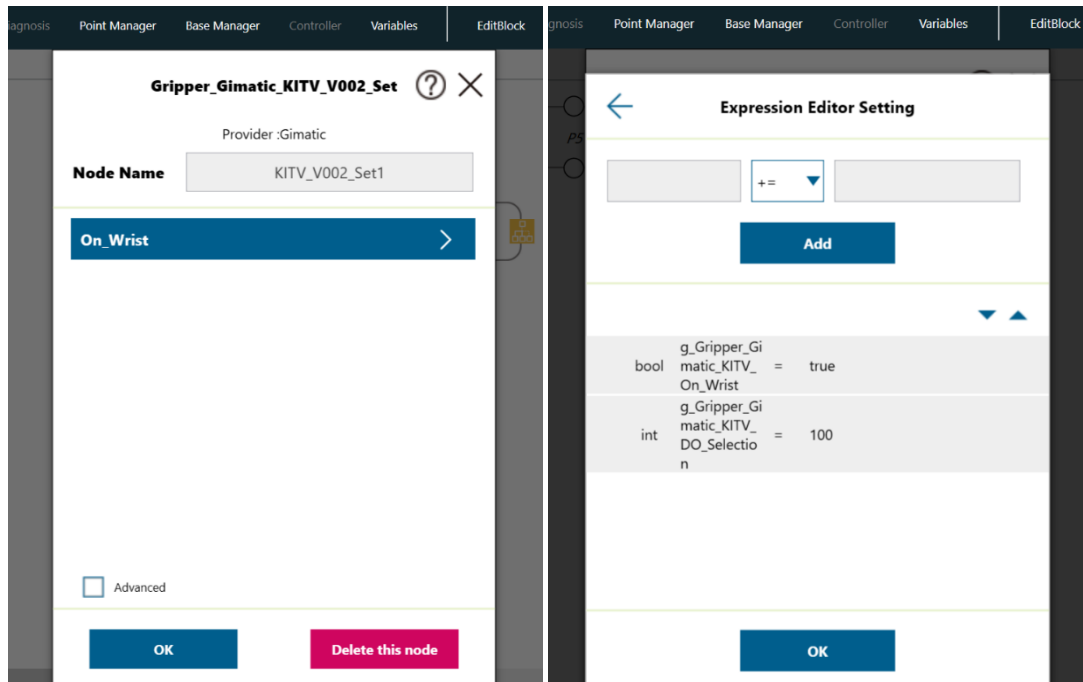
If the import operation is successfully completed, a success message box will appear, press the “OK” button to continue.

Choose “Component” on Robot Setting page and enable the components just imported on component list, select “Save” button and leave.



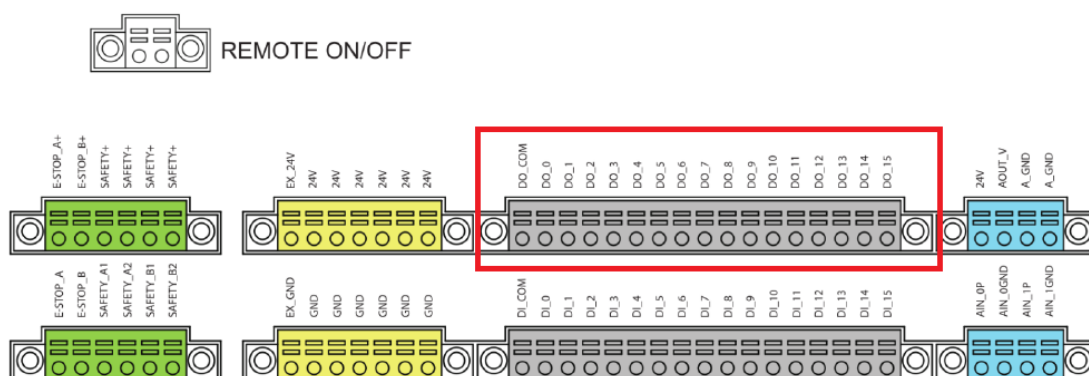
3. GIMATIC KITV SET

When starting a new project, please import the component denominated "Gripper_Gimatic_KITV_V002_Set" necessary to indicate where the KIT is phisically connected.



In fact, through the "On-Wrist" section it is possible to change the connection of the KIT from the wrist of the robot (default setting) to one of the digital outputs of the control box.

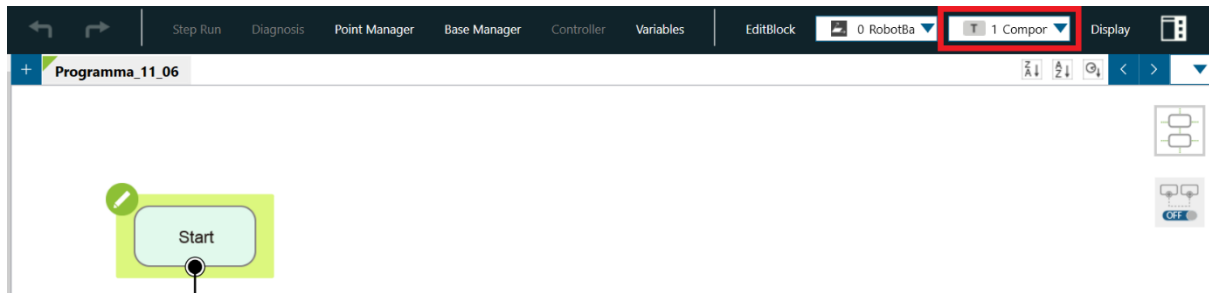
Control Box I/O configuration



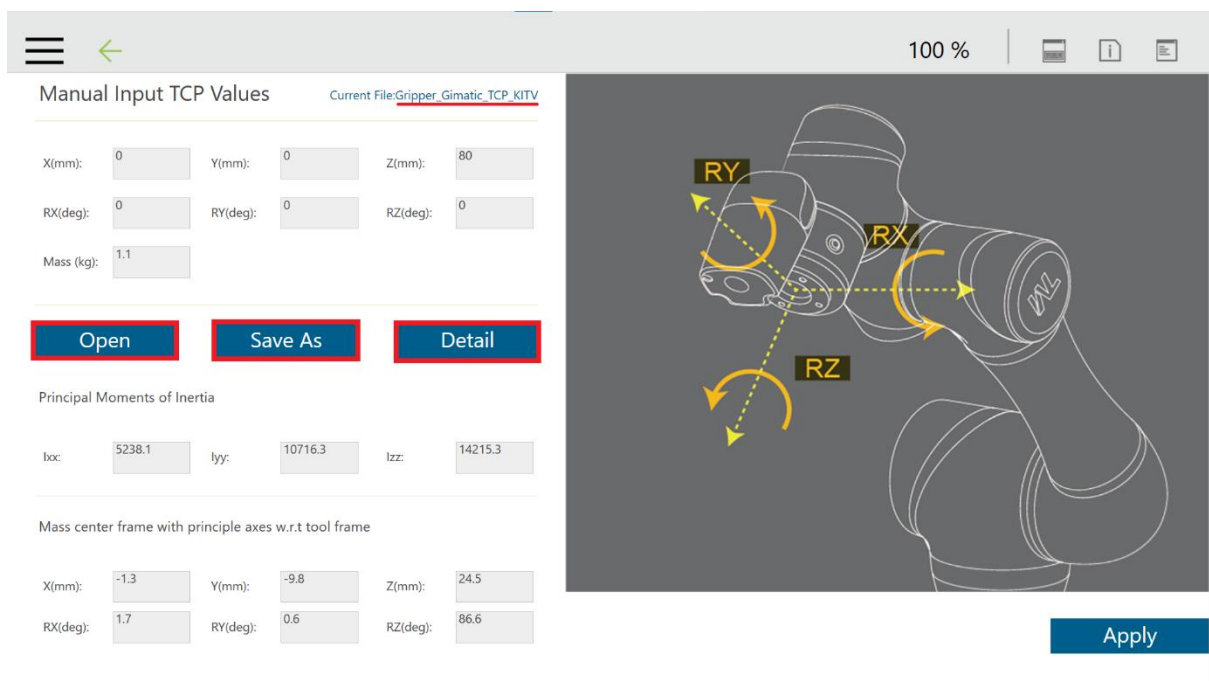
The following table summaris the parameters that can be set through this node.

Item	Variable	Type	Description
On_Wrist	g_Gripper_Gimatic_KITV_On_Wrist	Bool	True if the KIT is connected to the wrist of the robot, false if connected to the control box. (Default value = true).
On_Wrist	g_Gripper_Gimatic_KITV_DO_Selection	Int (0 ÷ 15)	Indicates the Digital Output of the control box to which the KIT is connected (used only in case of On_Wrist = false).

Once this node has been imported, 9 new TCP entries are automatically added in the top-right angle of the screen, corresponding at 8 work items plus the KIT-V TCP.



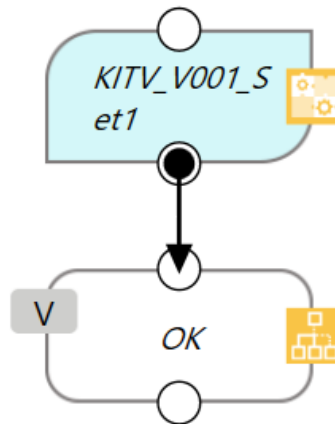
For each TCP the mass, geometric coordinates ("Value"), moment of inertia ("MOI") and mass center frame ("MCF") must be set through the appropriate section of the TM menu (*Setting* → *TCP Setting* → *Manual input parameters of TCP*):



Please pay attention that for "work item TCP" is intended the system including the tool and the user's specific work item. The default mass and geometric coordinates of the TCPs of the 8 work items are the same as those of the KIT-V and so they must be modified in consequence of the various combinations of tool and work item. The TCP of the KIT-V can also be modified.

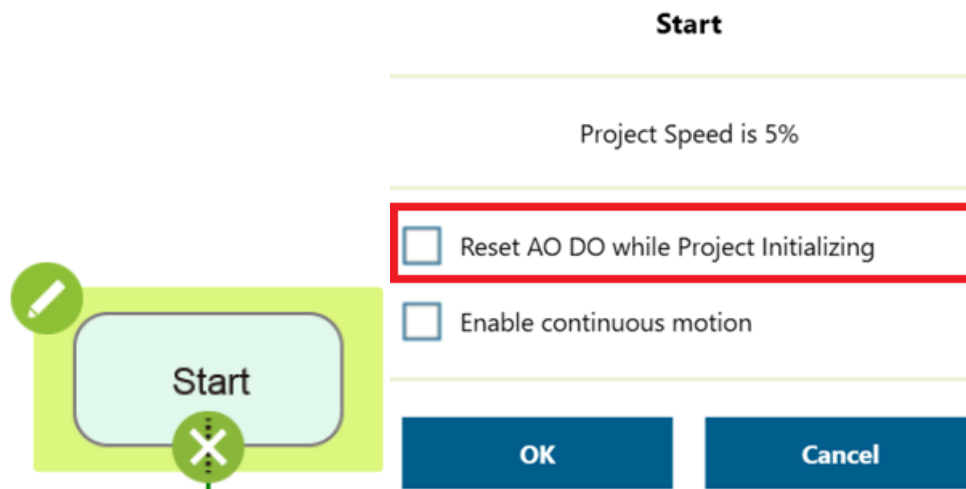
Modify the values corresponding to the KIT-V and the work items used in the application and leave the remaining TCPs unchanged (remember that "W11" means that the system includes the KIT-V plus the specific work item 1 and so on for the remaining work items).

The “GIMATIC KITV SET” component does not include any command but only set-up operations and so it can generate only one result.



Please pay attention that the setting (open from Start node pencil mark) of “Reset AO DO while Project Initializing” is checked as default. In this case, the tool will close once the project run.

If one want maintain unaltered the I/O this setting must be unchecked.



4. GIMATIC KITV GRIP

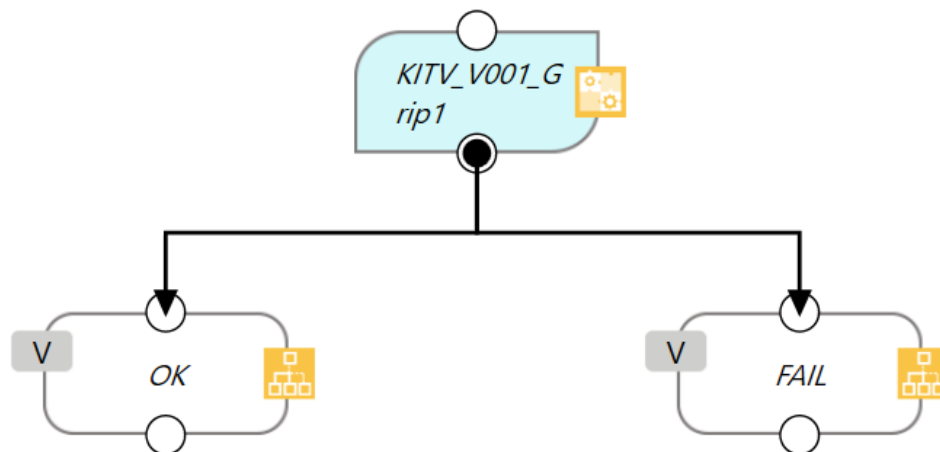
Please insert the component denominated “Gripper_Gimatic_KITV_V001_Grip” into the project to command a gripping operation.

When the program executes this node the digital output (previously configured in the Set node) command a grip operation.

For grip control is intended the vacuum generation to be able to take and transport objects through the tool.

The output results of this component could be:

- OK: if the program correctly controls the selected digital output
- FAIL: in any other case, for example if one have not correctly selected the digital output of the control box (in case of KIT connected to the control box).



It's possible to import as many Grip nodes as needed according to the specific robotic application.

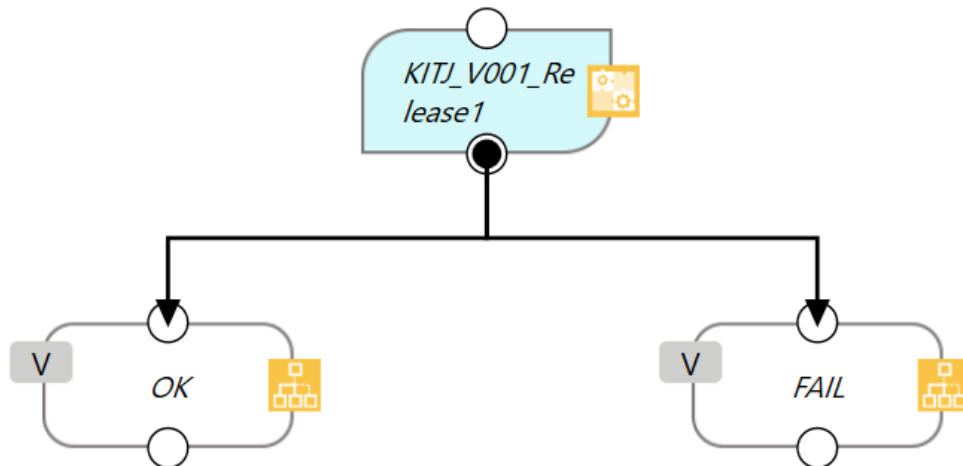
Please select “Inherit old component” when importing any additional Grip node to ensure that all the nodes share the same setup previously setted.

5. GIMATIC KITV RELEASE

This node (“Gripper_Gimatic_KITV_V001_Release”) must be imported to release a work item.

This node has the same characteristics of the Grip node, simply import the node into the project.

The possible outputs of this component follow the logic of the previous one.



It's possible to import as many Release nodes as needed according to the specific robotic application.

Please select “Inherit old component” when importing any additional Release node to ensure that all the nodes share the same setup previously setted.

6. PROGRAMMING WITHOUT TMFLOW CONTROL

TMflow provides a simpler process programming method for the gripper-type software packages.

On the robot setting page, click the **Gripper Button** to set the job triggered by the Gripper Button at the End Module.

The concept is when pressing the Gripper Button, a set of Component is added in the flow and executed once, and two Components are used in sequence (Grip and Release nodes).

For doing so, please click on “Using Customized Component” and select the “Gripper_Gimatic_KITV_V001_Grip” component as “Grip” and the “Gripper_Gimatic_KITV_V001_Release” component as “Release”.

As for our KIT-TM-V, this function is usefull to command a simply and quickly gripping (or a releasing) operation of a work item.

In practical applications, the robot uses the **FREE Button**, working with the buttons of End Module, to complete flow programming without TMflow control.

For further informations and instructions please refer to TMflow software manual.