

相机在伺服设定位置触发拍照使用方法

基于 mappMotion

Date: September 20, 2023

We reserve the right to change the content of this manual without prior notice. The information contained herein is believed to be accurate as of the date of publication, however, B&R makes no warranty, expressed or implied, with regards to the products or the documentation contained within this document. B&R shall not be liable in the event if incidental or consequential damages in connection with or arising from the furnishing, performance or use of these products. The software names, hardware names and trademarks used in this document are registered by the respective companies.

I Versions

Version	Date	Comment	Edited by
1.0	Sep 18, 2023	First Edition	邱赵煜

Table 1: Versions

II Distribution

Name	Company, Department	Amount	Remarks

Table 2: Distribution

III Safety Notices

Safety notices in this document are organized as follows:

Safety notice	Description
Danger!	Disregarding the safety regulations and guidelines can be life-threatening.
Warning!	Disregarding the safety regulations and guidelines can result in severe injury or heavy damage to mate- rial.
Caution!	Disregarding the safety regulations and guidelines can result in injury or damage to material.
Information:	Important information used to prevent errors.

Table 3: Safety notices

IV Table of Contents

1 应用场景介绍	4
2 软硬件配置	5
2.1 软件版本	5
2.2 硬件拓扑	5
3 ViBaseAxisBasedAcquisition 功能块说明	6
4 AS 程序配置方法	8

1 应用场景介绍

贝加莱视觉相机的优势在于可与 powerlink 网络同步,可采用时间戳触发模式以达到微秒级响应精度。 在较多印刷包装等应用场合中,需要使用相机与伺服电机或 Trak 进行位置同步以实现飞拍,在过去此类应 用中,需要根据设定的拍照位置计算网络延时,提前计算触发拍照的时间戳,其中需要获取到伺服循环周 期,powerlink 循环周期,task 循环周期,x2x 周期,相机触发信号处理周期,NettimeSoc 等参数用以计算 DelayTime,还需要根据实际照片的效果,对设定位置和延时时间等参数手动调整,整个过程较复杂。

在 mapp Vision 5.22 版本更新后,配合 mapp Motion,仅需简单配置和调用功能块的方式实现设定位 置自动拍照,直线相机与伺服位置同步。其优势在于可根据网络拓扑和程序所在任务周期自动计算延时时 间,且可根据实际情况进行上述参数微调,对于应用来说配置方便,也具有灵活性。劣势在于必须配合 mapp Motion 系统,老项目中如果使用了 ACP10 或 ncACTION,要添加视觉系统,该功能还是有一定局限 性。根据实际应用案例数量和 mapp Vision 软件功能更新侧重点推测,此功能应用场合可能更多地会与 ACOPOStrak 配合使用。



办公室测试使用 Smart Sensor 相机,在设定位置拍摄旋转运动中 Demo 设备上的箭头,并在每次拍摄 后使用 Matching 功能读取到箭头所在的像素坐标位置,在一段时间内累计记录坐标位置,计算最大偏移量 来反映拍照触发精度。本文档总结测试过程的经验,提供配置方式和功能块使用方法供参考,对 mapp Motion 和相机的基本使用配置不作详述,请参考相关培训材料。如果测试过程中遇到问题或有其它建议欢迎 指正交流!

2 软硬件配置

2.1 软件版本

注意,使用该功能必须将 mapp Vision 版本升级到 V5.22 及以上,mapp Motion 和 mapp View 也需同 步更新到对应版本。由于测试程序中有识别位置偏差量计算的功能块,因此额外加了 mapp Control,根据 实际情况 mapp Control 可加可不加。

Component	Prefe	erred	In use	Scope
Automation Runtime		B4.93	B4.93	Color.
Visual Components		V4.72.6	V4.72.6	1000
mapp Motion		5.22.2	5.22.2	*
mapp Services		not defined	not defined	*
📦 mapp View		5.22.1	5.22.1	*
mapp Vision		5.22.0	5.22.0	*
📦 mapp Cockpit		not defined	not defined	*
mapp Control		5.22.0	5.22.0	*
ACP10 ARNC0 (Motion)		not defined	not defined	*
📦 mapp Safety		not defined	not defined	*
Safety Release		not defined	not defined	

2.2 硬件拓扑



3 ViBaseAxisBasedAcquisition 功能块说明

ViBaseAxisBasedAcquisition 功能块基于轴位置计算机器视觉相机的图像采集时间戳,并在这些位置 采集图像。需要与相机同步的轴可直接在 Vision 应用组件中选择对应的 mapp Motion 轴名称进行配置。其 最大特点是在设定位置到达前,自动计算延迟时间,提前计算输出时间戳到相机,自动计算包含 CPU 获取 伺服编码器信号的延时、程序处理延时、通讯输出延时和相机数据处理延时,功能块也提供了开放参数可 手动校准输入输出延时。

Function block

			-	
	ViBaseAxisB	asedAcquisition		
&ViComponentType	MpLink	InOperation	\vdash	BOOL
BOOL —	Enable	Busy	\vdash	BOOL
ViBaseAxBsdAcqAcqParType	AcquisitionParameters	Error	\vdash	BOOL
ViBaseAxBsdAcqAdvParType	AdvancedParameters	StatusID	\vdash	DINT
BOOL	Update	UpdateDone	\vdash	BOOL
BOOL	PauseAcquisition	AdditionalInfo	\vdash	ViBaseAxBsdAcqInfoType
BOOL	ForceAcquisition			
			-	

Interface 🗉

1/0	Name	Data type	Description
IN	MpLink	Pointer to ViComponentType	Pointer to the vision component from which images should be acquired.
IN	Enable	BOOL	Enables the function block and starts the calculations.
IN	AcquisitionParameters	ViBaseAxBsdAcqAcqParType	Parameters that define when the acquisition is triggered depending on the axis position.
IN	AdvancedParameters	ViBaseAxBsdAcqAdvParType	Structure for using advanced functions.
IN	Update	BOOL	Updates the acquisition parameters. See Function description.
IN	PauseAcquisition	BOOL	If TRUE, the internal calculations are still active, but no image is acquired.
IN	ForceAcquisition	BOOL	A rising edge on this input will force an image acquisition as quickly as possible.
			Note:
			 By setting this input, an image is acquired even if PauseAcquisition is set.
OUT	InOperation	BOOL	The calculations are active, and the timestamps are forwarded to the vision component.
OUT	Busy	BOOL	The function block is active and must continue to be called.
OUT	Error	BOOL	Error during execution.
OUT	StatusID	DINT	Status information.
OUT	UpdateDone	BOOL	Indicates that new acquisition parameters have been initialized.
OUT	AdditionalInfo	ViBaseAxBsdAcgAddInfoType	Additional useful data, for example for system monitoring or error analysis.

当相机拍照设定为伺服位置触发时,<ImageAcquisition>和<DelayNetTime(n)>将不再生效,必须调 用此功能块,设定伺服位置点后自动触发拍照。如果需要强制手动触发拍照或暂停拍照,需要使用此功能 块中的指令。需要注意的是,为保证同步性,调用 mapp Motion 功能块的程序任务 tolerance 必须设 0。



在 ViBaseAxBsdAcqParType 结构体变量中,可以输入拍摄位置、轴周期和启动位置。在一个周期内 最多可以输入 8 个拍摄位置,StartPosition 可以理解为设定拍摄位置的偏移量,在实际应用中可以用于微 调

拍摄位置。

ViBaseAxBsdAcqAcqParType 🖃

Parameter	Data type	Description
AcquisitionPositions	EAL(8) Positions in [measurement units] within the defined "Period" or axis period in which images should be acquired. Notes: EAL(8) Positions in [measurement units] within the defined "Period" or axis period in which images should be acquired. Notes: • For index > 0, value 0.0 defines an inactive position. • Starting from the first inactive position array entries must also be defined as inactive. • All active positions must be strictly monotonically increasing. • Period in [measurement units] if a non-periodic axis is used or a different axis period than the one defined should be used. Defines the period within which the acquisition positions are defined or after which they are repeated. Note: • Only values greater than 0 and less than 2 ³¹ = the "measuring resolution" of the axis are permitted. .REAL Start position in [measurement units] of the period. Notes: • Non-periodic axis: The value corresponds to an absolute position value at which the period for the acquisition positions is started. If this position	
		 For index > 0, value 0.0 defines an inactive position.
		 Starting from the first inactive position, all following array entries must also be defined as inactive.
		 All active positions must be strictly monotonically increasing.
Period	LREAL	Period in [measurement units] if a non-periodic axis is used or a different axis period than the one defined should be used. Defines the period within which the acquisition positions are defined or after which they are repeated. Note:
		Only values greater than 0 and less than 2 ³¹ * the "measuring resolution" of the axis are permitted.
StartPosition	LREAL	Start position in [measurement units] of the period. Notes: • Non-periodic axis: The value corresponds to an absolute position value at which the period for the acquisition positions is started. If this position has
		already been exceeded, the function is started at the next multiple of "StartPosition" + "Period".
		 Periodic axis: The value corresponds to a position value within the axis period at which the function should be started. If a value other than "0" is specified, the start of "Period" is shifted with respect to the start of the axis period. Range of possible values: [0, axis period].

在 ViBaseAxBsdAcqAdvParType 结构体变量中,可以限定拍照时伺服的运动方向,也可以手动设定位 置输入延迟的补偿量和输出延时的补偿量。在系统自动计算出的输入位置延迟时间和输出到相机的延时时 间基础上再进行补偿。

ViBaseAxBsdAcqAdvParType 🖻

Parameter	Data type	Description
DisableNegativeDirection	BOOL	If TRUE, the image acquisition is only triggered when the position value of the axis increases.
AddPositionCompensation	Data type Description BOOL If TRUE, the image acquisition is only triggered when the position value of the axis increases. REAL The time value [s] configured here is added to the automatically determined position compensation time (see DefaultPositionCompensation VBasedAvBadAcqAddInfVype). If necessary, this can be used to compensate for the duration between the position evaluation and the reception of the position on the Negative values are also permitted. Note: If a position setpoint of an axis is used, the correct position compensation time is automatically determined internally. If actual p used (s.g. from an external encoder axis), the following times must also be taken into account: • Evaluation time of the encoder • Evaluation time of the counter module • Network cycle time (X2X, POWERLINK, etc.) • See also Automation Hep; • SXX Link - Latency times • OWERLINK - Toout latency. • PowerBLINK - Toout latency. • If necessary, this can be used to compensate for the duration required to transfer the timestamp to the camera module. • Network uses are also permitted. • Wates are also permitted. • VIB addAvBadAcqAddInfVype). • If necessary, this can be used to compensate for the duration required to transfer the timestamp to the camera module. • REFAL The time value [s] configured here is added to the automatically determined output compensation time. • Wath a default setting, the co	The time value [s] configured here is added to the automatically determined position compensation time (see DefaultPositionCompensation for ViBasedAxBsdAcqAddInfoType).
		If necessary, this can be used to compensate for the duration between the position evaluation and the reception of the position on the PLC.
		Negative values are also permitted.
		Note:
		 If a position setpoint of an axis is used, the correct position compensation time is automatically determined internally. If actual position values are used (e.g. from an external encoder axis), the following times must also be taken into account:
		Evaluation time of the encoder
		Evaluation time of the counter module
		Network cycle time (X2X, POWERLINK, etc.)
		See also Automation Help:
		<u>X2X Link - Latency times</u>
		POWERLINK - Input latency
AddOutputCompensation	LREAL	The time value [s] configured here is added to the automatically determined output compensation time (see DefaultOutputCompensation for ViBasedAxBsdAcqAddInfoType).
		If necessary, this can be used to compensate for the duration required to transfer the timestamp to the camera module.
		Negative values are also permitted.
		Note:
		 With a default setting, the correct output compensation time is automatically determined internally.
		Table: ViBaseAxBsdAcqAdvParType

ViBaseAxBsdAcqAddInfoType 结构体变量中,功能块输出自动计算出的输入位置延迟时间、输出到相 机的延时时间和输入到相机的时间戳。

ViBaseAxBsdAcqAddInfoType 🖃

Parameter	Data type	Description
DefaultPositionCompensation	REAL	Automatically determined position compensation time [s].
DefaultOutputCompensation	REAL	Automatically determined output compensation time [s].
TimestampCount	SINT	The value is changed when a new timestamp value is calculated for the image acquisition.
		Note:
		The value is not set if "PauseAcquisition" is set.
CalculatedTimestamp	DINT	Last calculated timestamp value forwarded to the vision component.
		Note:
		The value is not set if "PauseAcquisition" is set.
		Table: ViBaseAxBsdAcqAddInfoType

4 AS 程序配置方法



1. 设置 PLK 循环周期和 IP 地址,注意这里的 IP 不要与 CPU 的 IP 地址冲突。

2. 添加伺服硬件配置及 mapp Motion 配置,测试选择旋转周期性轴,单位度,精度 0.01 度。三环参数 根据实际情况使用 Cockpit 整定。



- Matching.visionapplication [Vision Application Editor] × 🦂 🧾 📰 💷 ImageAcquisition 00 Ξ *4*3 ion_Sync [Active X20CP3586 Cpu.sw Cpu.per PvMap.vvm PvMap.vvm Connectivity Connectivity Consectivity AccessAndSe mappMotion mappServices pagnaSafett \bigcirc NumResults FunctionPrecessingTime - 2 Matching 01 NumSearchMax nann Safeti ModeNumber mapp View mapp Visio Enable NumSe NumF Timeout ingTin Score Settings.vicfg viComp.vision Matching.visio MinScore Timeout 99 MinScore ٥, ModelNumber Scale laxOverlag Score Scale MaxOverlap PositionX Alignment OffsetROIX Alignment Position) • OffsetROIY OffsetROIOrientation OffsetROIRotCenterX OffsetROIRotCenterY Position) Orientation RotCenterX OffsetROD Orientation OffsetROIY RotCenterX Ť OffsetROIOrientation RotCenterY OffsetROIRotCenterX OffsetROIRotCenter
- 3. 在 mapp Vision 中添加配置文件,测试使用了<Matching>功能,配置接口变量。

在 mapp Vision 5.22 版本中,编辑功能需要手动以 Table 视窗打开,在<TriggerSource>中选择,
 <mappAxis>,并根据实际情况配置焦距单位等参数。保存后,相机 IO Mapping 中的
 <ImageAcquisition>变量将不再开放,默认自动触发。



Name	Туре	& Reference	Replicable Value	Description [1]	Channel Name	Process Variable	Data Type	Task Class
Vision					+ ReadFocus		UINT	
GVisionCtrl_type			•		+@ ReadExposureTime		UDINT	
- 🥬 🧼 Cmd	gVisionCtrlCmd_type		~		GainLevel		USINT	
[®] 🧼 Parameter	gVisionCtrlPar_type		~		Or SetFocus	::gVisionCtrl.Parameter.SetFocus	UINT	Automatic
🖉 🧼 Status	gVisionCtrlStatus_type		~		ExposureTime01	::gVisionCtrl.Parameter.ExposureTime	UDINT	Automatic
GVisionCtrlCmd_type			v		FlashColor01	::gVisionCtrl.Parameter.FlashColor	USINT	Automatic
🖉 🧼 Enable	BOOL		~		FlashSegment01	::gVisionCtrl.Parameter.FlashSegment	USINT	Automatic
Image: State St			✓		+ UndervoltageError		BOOL	
FlashColor	USINT				+ DigitalInput01		BOOL	
🕫 🧼 FlashSegment	USINT		~		DigitalOutput01		BOOL	
SetFocus	UINT		v		+ DigitalOutputStatus01		BOOL	
Exposure Time	UDINT				+ ImageAcquisitionReady	::gVisionCtrl.Status.Ready	BOOL	Automatic
NumSearchMax	USINT		v		+ ImageProcessingActive	::gVisionCtrl.Status.ImageProcessingActive	BOOL	Automatic
^{gi} 🧼 Timeout	UINT		v		SearchAcquisitionSettings		BOOL	
Min Score	USINT		V		● IRFilter		BOOL	
MaxOverlap	USINT				OhromaticLock		BOOL	
gVisionCtrlStatus_type			v					
[#] 🧼 Ready	BOOL		v		+ CameraProcessingTime		UINT	
	BOOL				+ ImageProcessingError		UINT	
Match_Results	gVisionCtrlStatusMatch_type		•		+ ImageNettime		DINT	
gVisionCtrlStatusMatch_type			~					
	USINT		v		O→ Enable	::gVisionCtrl.Cmd.Enable	BOOL	Automatic
^{III} 🧼 Result PosX	DINT				WumSearchMax	::gVisionCtrl.Parameter.NumSearchMax	USINT	Automatic
¹⁰ 🧼 Result PosY	DINT		v		Or Timeout	::gVisionCtrl.Parameter.Timeout	UINT	Automatic
Score	USINT		v		Of MinScore	::gVisionCtrl.Parameter.MinScore	USINT	Automatic
Motion					MaxOverlap	::gVisionCtrl.Parameter.MaxOverlap	USINT	Automatic
. ■ ■ Motion Man_type					Alignment		USINT	
■ Motion Man Step_enum					OffsetROIX		DINT	
-					OffsetROIY		DINT	
					OffsetROIOrientation		INT	
					OffsetROIRotCenterX		DINT	
					OffsetROIRotCenterY		DINT	
					+ NumResults	::gVisionCtrl.Status.Match_Results.ResultsNum	USINT	Automatic
					+ FunctionPrecessingTime		UINT	
					+ ModeNumber01		USINT	
					+ Score01	::gVisionCtrl.Status.Match_Results.Score	USINT	Automatic
					+O Scale01		USINT	
					+ PositionX01	::gVisionCtrl.Status.Match_Results.ResultPosX	DINT	Automatic
					+ Position Y01	::gVisionCtrl.Status.Match_Results.ResultPosY	DINT	Automatic

5. 在相机 IO Mapping 中关联相关结构体变量。

 下载程序,打开相机示教页面<xxx.xxx.xxx.81/index.html?visuid=visVision>,调试好光源、焦距 和曝光时间等参数,获取清晰照片后,在 Matching 模式下添加模型,将标记框在 ROI 区域内,识别 出箭头标志的模型。





7. 转动电机将箭头移动到其它几个不同位置,在示教页面手动拍照进行识别,测试是否能成功识别出模型位置坐标,确认无误后保存当前应用配置参数。完成后在 AS 中打开<Matching.visionapplication→ Compare Online>,在线将示教的 ROI 与模型同步到程序配置中,同时测试得到的光源、焦距、曝光时间等参数写在程序初始化段。



PP Vision Component: gCamera 😸 Vision Function: Matching 😸 🔘 a	15 🖉 5 📄 Vision Application: 💿 Ma	tching			
ROI Tools Q Filter Results Vision Applications		Edit Models			
. ↑ × ⊨ m ×	Parameters	Process 1	/ariables		
	ShapeSearchGreediness 0.90 ShapeSearchBorderShapeMo [0] false	\downarrow_9^1 Sort by: Result \otimes	Q All Results		
Save current application		Enable	[1] true		
Save As		NumSearchMax			
		Timeout			
		MinScore			
이 모든 이 지지 않는 것은 것 같은 것에 같은 것 같아요. 집에 있는 것이 같아요.		MaxOverlap			
		Alignment			
		OffsetROIX			
		OffsetROIY			
0		OffsetROIOrientation			
		OffsetROIRotCenterX			
		OffsetROIRotCenterY			
		TestExecute			
		CameraProcessingTime	142	ms	
		ImageProcessingError	0		
		ImageNettime	147568459	μs	
		NumResults	1		
		FunctionProcessingTime	136	ms	
		ModelNumber01	1		
		Score01	0.98	%/100	
	Constants	Scale01	0.99		
	NumRetuitsMay 1	PositionX01	890.92	px	
owing all result iconic data - Total number of results: 1 Color: 28, Coordinates: (779, 214) px	The second	PositionY01	530.82	рх	
		Orientation01	-131.07		





8. 以下程序用于计算每个周期设定位置拍摄的照片中,箭头图标在 X 和 Y 坐标上最大偏差值。

<ErrMax_PosX>和<ErrMax_PosY>可反映拍摄时间精度和同步性,单位为像素。

Name	Туре	& Reference	G Constant	🗬 Retain	Replicable				
MTDataMinMax_X	MTDataMinMax								
MTDataMinMax_Y	MTData Min Max								
ErrMax_PosX	REAL								
ErrMax_PosY	REAL			✓					
<pre>PROGRAM _CYCLIC gVisionCtrl; //Record the MaxError of acquired label position MTDataMinMax_X.Enable := USINT_TO_BOOL(gVisionCtrl.Status.Match_Results.ResultsNum); MTDataMinMax_X.In := DINT_TO_REAL(gVisionCtrl.Status.Match_Results.ResultPosX); MTDataMinMax_Y.Enable := USINT_TO_BOOL(gVisionCtrl.Status.Match_Results.ResultsNum); MTDataMinMax_Y.In := DINT_TO_REAL(gVisionCtrl.Status.Match_Results.ResultPosY); MTDataMinMax_Y.In := DINT_TO_REAL(gVisionCtrl.Status.Match_Results.ResultPosY);</pre>									
ErrMax_PosX := ABS(MTDataMinMax_X.MaxValue - MTDataMinMax_X.MinValue); ErrMax_PosY := ABS(MTDataMinMax_Y.MaxValue - MTDataMinMax_Y.MinValue);									
END_PROGRAM									

9. Motion 程序中添加<ViBaseAxisBasedAcquisition>功能块,在程序初始化段定义了拍摄位置 180°,周 期与轴周期相同 360°,启动位置设定为 0。循环程序中定义好 Enable 条件和其它输入变量并调用改

功能块。下载程序,注意该程序所在的 Task,Tolerance 需要设定为 0。

```
Name
                                                                                              Replicable
                                                         & Reference
                                                                       Constant
                                                                                   📾 Retain
                                Type
                                                                                                           Value
 ViBaseAxisBasedAcquisition_0
                               ViBaseAxisBasedAcquisition
                                                            4
 ViBaseAxBsdAcqAcqParTyp
                                                                                                  •
                                ViBaseAxBsdAcqAcqParType
ViBaseAxBsdAcqAdvParTyp
                               ViBaseAxBsdAcqAdvParType
                                                            V
PROGRAM _INIT
      (* Insert code here *)
  //To be done:
   // Motion function block initialization
       MotionMan.MpAxisBasicPar_0.Velocity := 360;//60rpm as default
       MotionMan.MpAxisBasicPar_0.Acceleration := 1800;
      MotionMan.MpAxisBasicPar_0.Deceleration := 1800;
      MotionMan.MpAxisBasic_0.Enable := TRUE;
MotionMan.MpAxisBasic_0.MpLink := ADR(gAxis_1);
       MotionMan.MpAxisBasic_0.Parameters := ADR(MotionMan.MpAxisBasicPar_0);
      MotionMan.MpAxisBasic 0();
L
       ViBaseAxBsdAcqAcqParTyp.AcquisitionPositions[0] := 180;//Set auto imageAcquisition position 1(180°) in one set period
      ViBaseAxBsdAcqAcqParTyp.AcquisitionPositions[1] := 270;//Set auto imageAcquisition position 2(270°) in one set period
       ViBaseAxBsdAcqAcqParTyp.Period := 360;
       ViBaseAxBsdAcqAcqParTyp.StartPosition := 0;
  END_PROGRAM
 PROGRAM CYCLIC
       // Main Motion state machine
I
       CASE MotionMan.Step OF
       // Motion function block call
I
      MotionMan.MpAxisBasic_0();
I
       ViBaseAxisBasedAcquisition_0.MpLink := ADR(gCamera);
       ViBaseAxisBasedAcquisition_0.Enable := MotionMan.cmdRun AND gVisionCtrl.Status.Ready;
      ViBaseAxisBasedAcquisition_0.AcquisitionParameters := ViBaseAxBsdAcqAcqParTyp;
ViBaseAxisBasedAcquisition_0.AdvancedParameters := ViBaseAxBsdAcqAdvParTyp;
      ViBaseAxisBasedAcquisition_0();
L
  END_PROGRAM
```

10. CPU 运行后,给电机 MoveVelocity 指令旋转,这时每经过 180°时相机会自动拍照。打开 SmartCameraViewer,可以看到静止的图片。尝试用遮挡物进行遮挡镜头,页面可实时显示,并可在 watch 窗口中监控到<gVisionCtrl.Status.Match_Results.ResultsNum>为 0,拿开遮挡物后又恢复为 1。



11. 测试中负载轮以 300rpm 转动,经过约 10 分钟后,在 Watch 中查看 X 与 Y 方向的最大像素偏差值。 同时在 5s 内 Trace 了<ResultPosX>和<ResultPosY>,偏差量 PP 值约 10 个像素。

A Motion::Motion.pvm [Watch] 🗙 🚮 Mot	ion::Motion [Structu	ired Text]			•	🐁 Vision::Vision.pvm [Watch] 🗙 🗟 Vision	::Vision [Structured Text]			
🛷 I 🚳 🔜 I 😽 🚸 I 🕞 💽 I 😫 🛞 I 1	X 🔾 😔					🥔 🕲 🖬 😽 🚸 🕞 🕞 😤 🗞 l	X o 🌖			
Name	Туре	Scope	Force	Value	^	Name	Туре	Scope	Force	Value
🖃 🧇 MotionMan	MotionMan_type	global				🖃 🧼 gVisionCtrl	gVisionCtrl_type	global		
⊢ <>> cmdRun	BOOL			TRUE		🕀 🔷 Cmd	gVisionCtrlCmd_t			
	MpAxisBasic					L 🧼 Enable	BOOL		9	TRUE
⊢ ♦ MpLink	UDINT			98800748		🕀 🧇 Parameter	gVisionCtrlPar_ty			
- 🔷 Enable	BOOL			TRUE		- IashColor	USINT		9	99
- Interventer -	BOOL			FALSE		- A Flash Segment	USINT		9	15
- Parameters	UDINT			98800496		- SetFocus	UINT		9	150
- 🔷 Update	BOOL			FALSE]	- A Exposure Time	UDINT		9	100
- Power	BOOL			TRUE		→ NumSearchMax	USINT		9	1
- 🔶 Home	BOOL			FALSE		- Imeout	UINT		9	2000
- A MoveVelocity	BOOL			TRUE		- Alin Score	USINT		9	80
- I MoveAbsolute	BOOL			FALSE		└	USINT		9	0
- Additive	BOOL			FALSE		🗄 🧇 Status	gVisionCtrlStatus			
- Stop	BOOL			FALSE		- 🔷 Ready	BOOL		٩	TRUE
- Index JogPositive	BOOL			FALSE		→ ImageProcessingActive	BOOL		9	FALSE
- IogNegative	BOOL			FALSE			gVisionCtrlStatus			
- 🔷 LimitLoad	BOOL			FALSE		- 🔷 ResultsNum	USINT		•	1
- ReleaseBrake	BOOL			FALSE		- 🔷 Result PosX	DINT		0	78240
- I Simulate	BOOL			FALSE		- 🔷 Result Pos Y	DINT		•	48633
- AutoTune	BOOL			FALSE		L 🔷 Score	USINT		0	97
- Active	BOOL			TRUE		ErrMax_PosY	DINT	local		104
- Imor	BOOL			FALSE		ErrMax_PosX	DINT	local		99
- 🔷 StatusID	DINT			0						
- 🔷 UpdateDone	BOOL			FALSE 200						
- Position	LREAL			150.83 SUULDIN						
- Velocity	REAL			1800.0						
- CommandBusy	BOOL			TRUE						
	0001			EN CE		1				



12. 更改 StartPosition 为 90°,即在设定拍照位置上加 90°,可以看到照片中箭头位置相对之前顺时针转了 90°。

🖃 🧇 MotionMan	MotionMan_type	global		Concerning 201 x + Concerning 201 x + Concerning 201 and a
⊢ <> cmdRun	BOOL		TRUE	
	MpAxisBasic			
MpAxisBasicPar_0	MpAxisBasicPar			
L 🔷 Step	MotionManStep		stRUN	
ViBaseAxisBasedAcquisition_0	ViBaseAxisBase	local		
ViBaseAxBsdAcqAcqParTyp	ViBaseAxBsdAci	local		
🕂 🔷 AcquisitionPositions	LREAL[07]			
Acquisition Positions[0]	LREAL		180.0	
Acquisition Positions[1]	LREAL		0.0	
 Acquisition Positions[2] 	LREAL		0.0	
 Acquisition Positions[3] 	LREAL		0.0	
 Acquisition Positions[4] 	LREAL		0.0	
- Acquisition Positions [5]	LREAL		0.0	
Acquisition Positions[6]	LREAL		0.0	
Acquisition Positions[7]	LREAL		0.0	
- <> Period	LREAL		360.0	
└ <>> Start Position	LREAL		90.0	
🕀 🧇 ViBaseAxBsdAcqAdvParTyp	ViBaseAxBsdAci	local		

13. 监控 AdditionalInfo,可以看到当前的延时补偿时间。

输入位置延时时间为 0.8ms,由 1 个伺服运算周期 0.4ms 和一个 PLK 周期 0.4ms 组成。 输出延时补偿时间为 12.15ms,由任务循环 10ms,PLK 周期 0.4ms,其余 2.11ms 个人推测是包含 了相机内部 Buffer 处理到执行拍照的延时时间,和 HUB 延时时间。此处运算机制帮助中没有特别清 晰的解释,此处如有问题请及时指正。

· ····	· · · · · · · · · · · · · · · · · · ·	
ViBaseAxisBasedAcquisition_0	ViBaseAxisBase local	
– 🧇 MpLink	UDINT	98800764
- 🔷 Enable	BOOL	TRUE
🕂 🧇 Acquisition Parameters	ViBaseAxBsdAc	
	ViBaseAxBsdAc	
- 🔷 Update	BOOL	FALSE
- PauseAcquisition	BOOL	FALSE
- I ForceAcquisition	BOOL	FALSE
- InOperation	BOOL	TRUE
- 🔷 Busy	BOOL	TRUE
- Internet	BOOL	FALSE
- I StatusID	DINT	0
- 🔷 UpdateDone	BOOL	FALSE
🕂 🧇 AdditionalInfo	ViBaseAxBsdAcc	
Default PositionCompensation	REAL	0.0008
DefaultOutputCompensation	REAL	0.01215
- ImestampCount	SINT	28
└ <> CalculatedTimestamp	DINT	593753324
🗄 🔷 Internal	ViBaseInternalTy	

当将任务周期改为 2ms 后,相较 10ms 时输出延时,正好减少了 8ms,说明自动计算了当前任务周期。

😘 Motion::Motion.pvm [Watch] 🗙 🗟 Motion::Motion [Structured Text] 🛛 🗃 X20CP3586 [Software]							
🍼 🗠 🖬 😹 🚸 🕞 🔂 🤹 🐌 🕱 🗢 📎							
Name	Туре	Scope	Fc	Value			
🖃 🧇 MotionMan	MotionMan_type	global					
- → cmdRun	BOOL			TRUE			
	Mp Axis Basic						
	MpAxisBasicPar						
L	Motion Man Step			stRUN			
ViBaseAxisBasedAcquisition_0	ViBaseAxisBase	local					
🚽 🔶 MpLink	UDINT			98781524			
- Inable	BOOL			TRUE			
🕂 🧼 AcquisitionParameters	ViBaseAxBsdAce						
	ViBaseAxBsdAci						
⊢ <>> Update	BOOL			FALSE			
- PauseAcquisition	BOOL			FALSE			
- I ForceAcquisition	BOOL			FALSE			
- InOperation	BOOL			TRUE			
⊢	BOOL			TRUE			
Error	BOOL			FALSE			
- I StatusID	DINT			0			
↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓	BOOL			FALSE			
🕂 🔶 AdditionalInfo	ViBaseAxBsdAci						
Default PositionCompensation	REAL			0.0008			
DefaultOutputCompensation	REAL			0.00415			
│	SINT			0			
└ Calculated Timestamp	DINT			0			
🗄 🧼 Internal	ViBaseInternalTy						