

WonderCam Register List instruction:

- ① WonderCam register arranges with 16-bit addresses linearly ,0x0000 ~ 0xFFFF. All registers is within the same address space.
- ② When writing the address, the upper-byte are followed by the lower-byte, that is little-endian. and it also be used in other registers
- ③ 12C Bus supports 400k standard and 100k rates. 400k is recommended to use and the display width is 320x240px.
- ④ Not otherwise stated case, all the coordinate values are 16-bit signed numbers.
- ⑤ Not otherwise stated case, width and height refer to the pixel height and pixel width in display, which all is function number of the 16-bit signed numbers. Facial recognition is 1, Object recognition is 2, Image classification is 3, Feature learning is 4, Visual line following is 6, Tag recognition is 7, QR code recognition is 8, Barcode recognition is 9, None is 0.
- ⑥ Object ID for object recognition are plane, bicycle, bird, boat, bottle, bus, car, cat, chair, cow, desk, dog, horse, motorcycle, people, plant, sheep, sofa, train. To obtain the result of a function, the base address or result refresh register of this function are needed to read first.
- ⑦ The reading can be divided into stages. The first 48 bytes can be read first. It summarizes how many results have been identified and which have been identified successfully, and then read the data out of results as needed.

List:

Register Name	Addresses	Function	R/W	Instruction
SYS_FIRMWARE_VERSION	0x0000	Firmware version base address	R	The sixteen consecutive bytes are the version number string such as "v0.6.5"
SYS_LIGHT_STATE	0x0030	Fill light switch register	RW	on=1 off=0
SYS_CURRENT_FUNCTION	0x0035	Current run function number	RW	Enter function number to switch running function. After coding, re-reading, this register checks whether it is effective. The effective realization process

				with different functions may take 0.X seconds to 3 seconds
FACEDTECT_BASE/ FACEDTECT_CURRENT_FUNC	0x0400	Facial recognition function register base address/ Facial recognition result refresh register	R	Read register. if it is facial recognition, WonderCam will save the result into register. The reading value is the function number of the running function.
FACEDTECT_RESULT_NUM	0x0401	The amount of faces recognized in the current display	R	Unrecognized Face is 0.
FACEDTECT_RESULT_ID_NUM	0x0402	The amount of learned faces is recognized in the current display	R	Recognized face is framed in color. It will show 0 if it is unrecognized.
FACEDTECT_RESULT_NOID_NUM	0x0403	Unlearned face is recognized in the display	R	This is ,the face is framed in white frame. It will show 0 if it is unrecognized.
FACEDTECT_RESULT_IDS	0x0404	The ID of the first recognized face	R	ID for the first recognized face. 1~5 ID value for learned face, 0xFF for unlearned face.

	0x0405	The ID of the second recognized face	R	The result same as above.
	0x0406 ~ 0x0429	The ID of the third and fourth.... recognized face	R	
FACEDETECT_RESULT1_XL	0x0430	The x-coordinate of the first recognized face is lower-byte	R	
FACEDETECT_RESULT1_XH	0x0431	The x-coordinate of the first recognized face is upper-byte	R	
FACEDETECT_RESULT1_YL	0x0432	The Y-coordinate of the first recognized face is lower-byte	R	
FACEDETECT_RESULT1_YH	0x0433	The Y-coordinate of the first recognized face is upper-byte	R	
FACEDETECT_RESULT1_WL	0x0434	The Width coordinate of the first recognized face is lower-byte	R	
FACEDETECT_RESULT1_WH	0x0435	The Width coordinate of the first recognized face is upper-byte	R	
FACEDETECT_RESULT1_HL	0x0436	The height of the first recognized face is lower-byte	R	

FACEDTECT_RESULT1_HH	0x0437	The height of the first recognized face is upper-byte	R	
	0x0438 ~ 0x043F	the first face recognized result.saved and unused	R	
	0x0440 ~ 0x044F	The second recognized face	R	The register meaning is the same as the first face result register.
	0x0450 ~ 0x045F	The second recognized face	R	The meaning of the register is the same as that of the first face result register. By analogy, each offset of 16 bytes is a result.
OBJDETECT_BASE_IDS OBJDETECT_CURRENT_FUNC	0x0800	Object recognition function register base address/ Object recognition result refresh register	R	Enter register, if it is object recognition function, WonderCam will save the result into register. The reading value is the function number of running function.
OBJDETECT_RESULT_NUM	0x0801	The amount of objects recognized in the current display	R	Unrecognized Face is 0.

OBJDETECT_RESULT_ID S	0x0802	The ID of the first recognized object	R	The ID of the first object recognized
	0x0803 ~ 0x0829	The ID of the third and fourth.... recognized object	R	
OBJDETECT_RESULT1_X L	0x0830	The x-coordinate of the first recognized object is lower-byte	R	
OBJDETECT_RESULT1_X H	0x0831	The x-coordinate of the first recognized object is upper-byte	R	
OBJDETECT_RESULT1_Y L	0x0832	The Y-coordinate of the first recognized object is lower-byte	R	
OBJDETECT_RESULT1_Y H	0x0833	The Y-coordinate of the first recognized object is upper-byte	R	
OBJDETECT_RESULT1_W L	0x0834	The width coordinate of the first recognized object is lower-byte	R	
OBJDETECT_RESULT1_W H	0x0835	The width coordinate of the first recognized object is upper-byte	R	
OBJDETECT_RESULT1_H L	0x0836	The height of the first recognized object is lower-byte	R	

OBJDETECT_ RESULT1_H H	0 x0 83 7	The height of the first recognized object is upper-byte	R	
	0x0838 ~ 0x083 F	the first recognized object.reserved and unused	R	
	0x0840 ~ 0x084 F	the second recognized object	R	The register meaning is is consistent with the first face result register.
	0x0850 ~ 0x085 F	the third recognized object	R	The meaning of the register is the same as that of the first face result register. By analogy, each offset of 16 bytes is a result.
CLASSIFICATION_BA SE / CLASSIFICATION_CU RR ENT_FUNC	0x0C00	Image classification function register base address/ Object recognition result refresh register	R	Enter register, if it is running Image classification function, WonderCam will save the result into register. The reading value is the function number of running function.
CLASSIFICATION_RES U LT_ID	0x0C01	Max confidence in image classification	R	The ID for max confidence in image classification.
CLASSIFICATION_RES U LT_RESULT_QULITYL	0x0C02	The lower-byte of ID for max confidence in image classification	R	The confidence is a 16-bit unsigned number. Divided by 10000 is a decimal number between 0 and 1.

CLASSIFICATION_RESULT_QUALITYH	0x0C03	The upper-byte of ID for max confidence in image classification	R	
CALSSIFICATION_ID1_QUALITYL	0x0C10	The lower - byte of ID1 classification in image classification	R	
CALSSIFICATION_ID1_QUALITYH	0x0C11	The upper - byte of ID1 classification in image classification	R	
reserve	0x0C12	Confidence of ID1 classification in image classification. Reserved.		
reserve	0x0C13	Confidence of ID1 classification in image classification. Reserved.		
	0x0C14 ~ 0x0C17	Confidence of ID2 classification in image classification. Reserved.		Every 4 bytes is the confidence of a classification.
FEATURELEARNING_BASE / FEATURELEARNING_CURRENT_FUNC	0x0E00	Feature Learning register base address /Feature Learning result refresh register	R	Enter this register, if it is running Feature Learning function, WonderCam will save the result into register. The reading value is the function number of running function.
FEATURELEARNING_RESULT_ID	0x0E01	The feature ID with the greatest similarity to the current image in feature learning	R	
FEATURELEARNING_RESULT_QUALITYL	0x0E02	The similarity of feature learning and current image	R	The similarity is a 16-bit Divide by 10000 is a decimal between 0 and 1.

		is similar to the greatest ID		
FEATURELEARNING_RESULT_RESULT_QULITYH	0x0E03	The similarity of the feature ID1 in feature learning and current image is upper-byte	R	
CALSSIFICATION_ID1_Q ULITYL	0x0E10	The similarity of the feature ID1 in feature learning and current image is lower-byte	R	
CALSSIFICATION_ID1_Q ULITYH	0x0E11	The similarity of the feature ID1 in feature learning and current image is upper-byte	R	
reserve	0x0E12	The similarity of the feature ID1 in feature learning ,reserved	R	
reserve	0x0E13	The similarity of the feature ID1 in feature learning ,reserved	R	
	0x0E14 ~ 0x0E17	The similarity of the feature ID2 in feature	R	By analogy, every 4 bytes is the confidence of a feature.

COLORDETECT_BASE / COLORDETECT_CURRENT_FUNC	0x1000	Color Recognition register base address/Feature Learning result refresh register	R	Enter this register, if it is running Color Recognition function, WonderCam will save the result into register. The reading value is the function number of running function.
COLORDETECT_RESULT_NUM	0x1001	The number of colors recognized	R	The unrecognized color block is 0
COLORDETECT_RESULT_IDS	0x1002	ID of the first recognized color	R	
	0x1002 ~ 0x1029	The ID of the third and fourth.... recognized color	R	
COLORDETECT_RESULT_XL	0x1030	The x-coordinate of the first recognized color is lower-byte	R	
COLORDETECT_RESULT_XH	0x1031	The x-coordinate of the first recognized color is upper-byte	R	
COLORDETECT_RESULT_YL	0x1032	The Y-coordinate of the first recognized color is lower-byte	R	
COLORDETECT_RESULT_YH	0x1033	The Y-coordinate of the first recognized color is upper-byte	R	
COLORDETECT_RESULT_WL	0x1034	The width of the first recognized color is lower-	R	

		byte		
COLORDETECT_RES ULT _WH	0x1035	The width of the first color result is upper-byte	R	
COLORDETECT_RES ULT _HL	0x1036	The height of the first recognized color is lower-byte	R	
COLORDETECT_RES ULT _HH	0x1037	The height of the first recognized color is upper-byte	R	
reserve	0x1038 ~ 0x103 F	The first color recognized color, reserve d.	R	
	0x1040 ~ 0x104 F	The second recognized color	R	By analogy, each offset of 16 bytes is a color result, and the register meaning is consistent with the first result.
LINEFOLLOWBASE / LINEFOLLOW_CUR RENT _FUNC	0x14 00	Visual Line Following register base address/ Visual Line Following result refresh register	R	Enter register, if it is running Visual Line Following function, WonderCam will save the result into register. The reading value is the function number of running function.

LINEFOLLOW_RESULT_NUM	0x1401	The number of lines recognized in the current display	R	
LINEFOLLOW_IDS	0x1402	Corresponding ID for the first line result	R	
	0x1403 ~ 0x1404	Corresponding ID for the second, third . . .line result	R	
LINEFOLLOW_RESULT1_START_XL	0x1430	The X-coordinate of the arrow tip of the first line result is lower-byte	R	
LINEFOLLOW_RESULT1_START_XH	0x1431	The X-coordinate of the arrow tip of the first line result is upper-byte	R	
LINEFOLLOW_RESULT1_START_YL	0x1432	The Y-coordinate of the arrow tip of the first line result is lower-byte	R	
LINEFOLLOW_RESULT1_START_YH	0x1433	The Y-coordinate of the arrow tip of the first line result is upper-byte	R	
LINEFOLLOW_RESULT1_END_XL	0x1434	The X-coordinate of the arrow tail of the first line result is lower-byte	R	
LINEFOLLOW_RESULT1_END_XH	0x1435	The X-coordinate of the arrow tail	R	

		of the first line result is upper-byte		
LINEFOLLOW_RESULT1_END_YL	0x1436	The Y-coordinate of the arrow tail of the first line result is lower-byte	R	
LINEFOLLOW_RESULT1_END_YH	0x1437	The Y-coordinate of the arrow tail of the first line result is upper-byte	R	
LINEFOLLOW_RESULT1_THETA_L	0x1436	The deflection of the first line result is lower-byte	R	
LINEFOLLOW_RESULT1_THETA_H	0x1437	The deflection of the first line result is upper-byte	R	
LINEFOLLOW_RESULT1_THETA_L	0x1438	The offset of the first line result is lower-byte	R	
LINEFOLLOW_RESULT1_THETA_H	0x1439	The offset of the first line result is upper-byte	R	
Reserve	0x143A ~ 0x143F	The first line result, reserved	R	

	0x1440 ~ 0x144F	the second line result	R	By analogy, 16 bytes offset is a result, and the register meaning is consistent with the first result.
QRCODE_BASE / QRCODE_CURRENT_FUNC	0x1800	QR code recognition register base address/QR code recognition result refresh register	R	Reading register, if it is running QR code recognition function, WonderCam will save the result into register. The reading value is the function number of running function.
QRCODE_CURRENT_RESULT_NUM	0x1801	The number of recognized QR codes	R	The maximum value is 1, 0 is unrecognized.
QRCODE_LENGTH_L	0x1820	QR code content bytes is lower-byte	R	16-bit unsigned number
QRCODE_LENGTH_H	0x1821	QR code content bytes is lower-byte	R	
QRCODE_DATA	0x1830	QR code content start address	R	Subsequent addresses, less than 0x1830 + QRCODE_LENGTH are all QR codes content, but QRCODE_LENGTH does not exceed 400.
BARCODE_BASE / BARCODE_CURRENT_FUNC	0x1C00	Barcode base address/Barcode refresh register	R	Reading register, if it is running Barcode recognition function, WonderCam will save the result into register. The reading value is the function number of running function.
BARCODE_RESULT_NUM	0x1C01	Number of recognized barcodes	R	The maximum value is 1, 0 is unrecognized.
BARCODE_LENGTH_L	0x1C20	Barcode content bytes is lower-byte	R	16-bit unsigned number
BARCODE_LENGTH_H	0x1C21	Barcode content bytes is upper-byte	R	

BARCODE_DATA	0x1C30	Barcode content start address	R	Subsequent addresses, less than 0x1830 + QRCODE_LENGTH are all barcodes content, but QRCODE_LENGTH does not exceed 400.
APRILTAG_BASE/ APRILTAG_CURRENT_ F UNC	0x1E00	Tag Recognition register base address/ Tag Recognition result refresh register	R	Reading register, if it is running Barcode recognition function, WonderCam will cache the result into register. The reading value is the function number of running function.

APRILTAG_RESULT_NUM	0x1E02	The number of tags recognized in the current screen	R	
APRILTAG_IDS	0x1E03	The ID of the first recognized tag	R	
	0x1E04 ~ 0x1E29	The ID of the second, third.... recognized tag	R	
APRILTAG_RESULT1_XL	0x1E30	The X-coordinate of the center of the first result is lower -byte	R	
APRILTAG_RESULT1_XH	0x1E31	coordinate of the center of the first result is upper -byte	R	
APRILTAG_RESULT1_YL	0x1E32	The Y-coordinate of the center of the first result is lower -byte	R	
APRILTAG_RESULT1_YH	0x1E33	The Y-coordinate of the center of the first result is upper -byte	R	
APRILTAG_RESULT1_WL	0x1E34	The width of the first result is lower-byte	R	
APRILTAG_RESULT1_WH	0x1E35	The width of the first result is upper-byte	R	
APRILTAG_RESULT1_HL	0x1E36	The height of the first result is lower-byte	R	
APRILTAG_RESULT1_HH	0x1E37	The height of the first result is upper-byte	R	
APRILTAG_RESULT1_X_TRANSFROM	0x1E38 ~ 0x1E3B	X-axis transformation of the first result	R	Float type, Little-endian
APRILTAG_RESULT1_X_ROTATE	0x1E3C ~	X-axis rotation of the first result	R	Float type, Little-endian

	0x1E3 F			
APRILTAG_RESULT1_Y _TRANSFROM	0x1E40 ~ 0x1E 43	Y-axis transformation of the first result	R	Float type, Little- endian
APRILTAG_RESULT1_Y _ROTATE	0x1E44 ~ 0x1E 47	Y-axis rotation of the first result	R	Float type, Little- endian
APRILTAG_RESULT1_Z _TRANSFROM	0x1E48 ~ 0x1E4 B	Z-axis transformation of the first result	R	Float type, Little- endian
APRILTAG_RESULT1_Z _ROTATE	0x1E4 C ~ 0x1E4 F	Z-axis rotation of the first result	R	Float type, Little- endian

	0x1E50 ~ 0x1E6F	The second recognized tag	R	By analogy, each offset of 32 bytes is a tag result, and the register meaning is consistent with the first result.
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