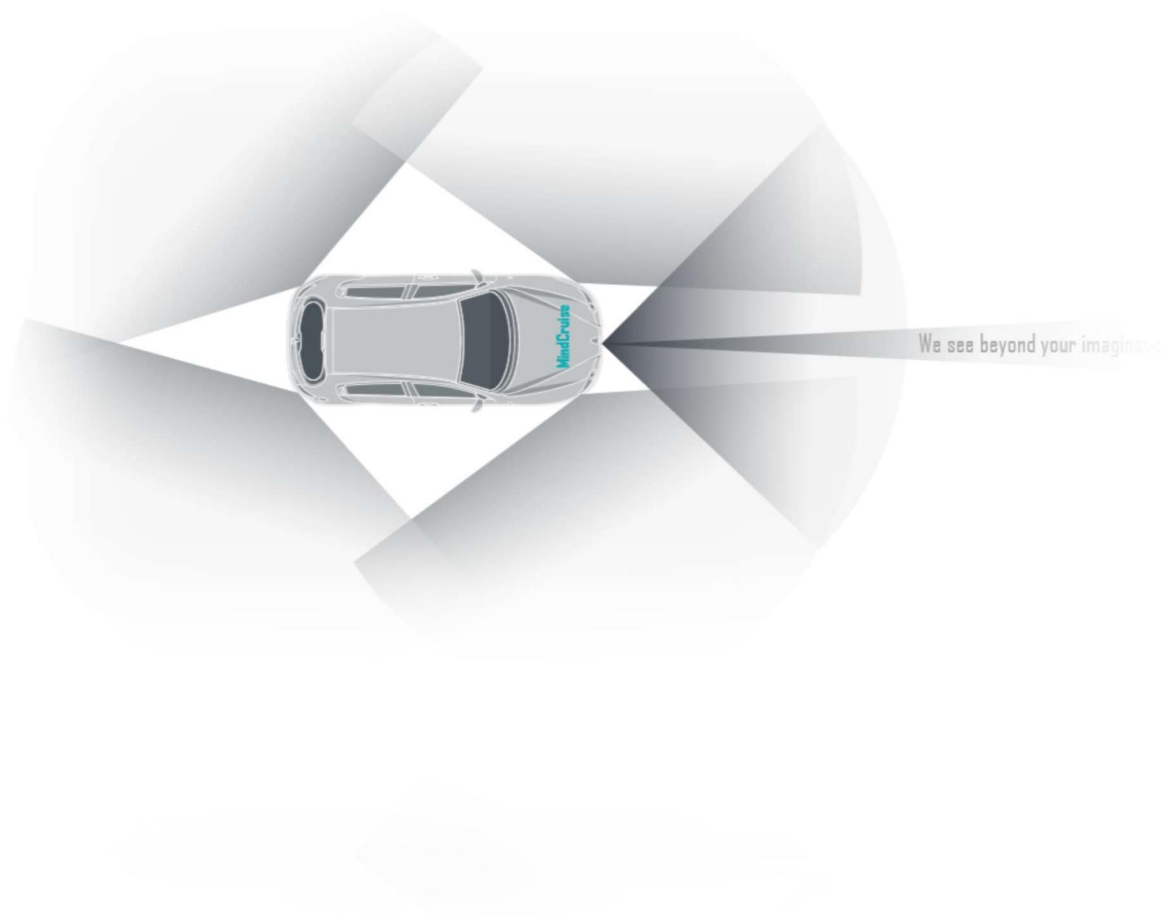


MindCruise

S3CF 用户使用手册/S3CF User Manual





<i>Project:</i> CFMOTO ACC	<i>Status:</i>
<i>Document ID:</i> 157152179	<i>Version:</i> 4
<i>Initiator:</i> jian.wang	<i>Initial date:</i> Oct 31, 2024
<i>Last Modifier:</i> jian.wang	<i>Modify date:</i> Nov 04, 2024
<i>Document Repository:</i> http://192.170.41.200:8004/x/s-NdCQ	

Note: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This device complies with FCC radiation exposure limits set forth for an uncontrolled environment. This device should be installed and operated with minimum distance 20cm between the radiator & your body.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



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1 前言

Product: S3CF

Spec Type: SYS

Security Level: Partners

General Description:

This spec is used as guideline to MindCruise customers to understand how to start work with MC3.0 Radar.



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2 术语/Terms

缩写/Term	全称/Full Description
MC	MindCruise
FLR	Front Left Radar
FRR	Front Right Radar
RRR	Rear Right Radar
RLR	Rear Left Radar
FMR	Front Middle Radar
FOV	Field Of View 可视角度
GW	Gateway
PC	Personal Computer
IPC	Industrial Personal Computer



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3 雷达基本信息/Radar Basic Information

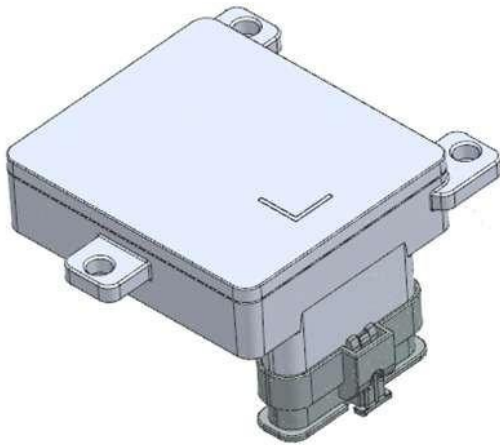
3.1 S3CF 雷达简介/S3CF Breif

S3CF 雷达是MindCruise 公司第三代 77GHz 前雷达产品，可提供 FCW, ACC, AEB 功能，可支持 L2 级别和限定条件下的 L3 级别的自动驾驶。

S3CF is third generation corner radar of MindCruise which provides integrated FCW, ACC, AEB features and can support up to L3 ADAS features.

S3CF 雷达产品外观如下：

S3CF Radar product appearance is as follows:



3.2 S3CF 雷达性能/S3CF Parameters

参数 Parameters	值/Value
天线布置 Antenna	4 发 4 收 4Tx/4Rx
探测距离 Max. Detection Range	250m
最小距离 Min. Detection Range	0.25m
距离精度 Distance Accuracy	0.25m
距离分辨率 Distance Resolution	0.5m
水平可视角度 FoV	90° @50m 16° @50m - 100m 8° @100m - 250m



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水平角度精度 Angle Accuracy	0.3°
水平角度分辨率 Angle Resolution	6.04° (PM: 2.1° @ 16° @<100m)
垂直角度精度 Elevation Accuracy	0.3
速度范围 Velocity Detection Range	-80m/s~80m/s
速度探测精度 Velocity Detection Accuracy	0.05m/s
速度分辨率 Velocity Detection Resolution	0.2m/s
最大探测点数 Max. Detection Output	200
最大目标数 Max. Object Output	40
支持功能 Self-integrated Features	FCW, ACC, AEB
CAN 通道 CAN Channel	CANFD x2
遮挡检测 Blockage Detection	Supported

3.3 S3CF CAN Matrix

S3CF 雷达共计 2 路CAN 通道，可支持CAN/CANFD,CAN Matrix 如附件。

S3CF Radar has two CAN channels in total, which support CAN or CANFD, and CAN Matrix can be found in Appendix.

FB70_0.4_LiTop_CAN_FRS_20240926_163712_Draft.dbc

20240626_MC1_FM-ACC1014.dbc

3.4 S3CF 雷达输出信息/S3CF Output Information

3.4.1 雷达状态信息/Radar Status

在当前CAN Matrix 中，S3CF 雷达将会以 50ms 的周期输出雷达的状态。

In currently defined CAN matrix, S3CF outputs radar status every 50ms.

信号名称/Signal Name	信号说明/Signal Description
RS_Latency	目标在雷达中形成到输出到 CAN 接口上的延迟时间 / Specify latency from "radar forms output information" to "information is output in CAN interface"



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信号名称/Signal Name	信号说明/Signal Description
RS_Sts_Failure	雷达是否出现故障 / Indicate whether radar has failures
RS_Sts_Blkg	雷达是否出现遮挡 /Indicate whether radar has blockage

3.4.2 目标信息/Object

在当前CAN Matrix 中，S3CF 雷达将会以 50ms 的周期输出最多 40 个目标的追踪信息。若被追踪的目标不足 40 个，则CAN 信号将会是默认值状态输出，需要使用方法进行判定。

In currently defined CAN matrix, S3CF outputs up to 40 objects every 50ms. If existing objects in environment are less than 40, CAN signals still output 40 objects with dummy objects whose attributes are set to default.

If user wants to filter dummy objects, then a specified methodology shall be followed.

目标信息说明如下表/Object Description Table:

信号名称/Signal Name	信号说明/Signal Description
RS_Obj[xx]_ID	信号坐标系/Signal Coordinates: -
	信号基本功能/Signal basic function: 目标 ID，若是无效目标，则该值为 0x1FFF Object ID, in case of dummy object, Object ID = 0x1FFF
RS_Obj[xx]_XPos RS_Obj[xx]_YPos RS_Obj[xx]_XPos_Stdev RS_Obj[xx]_YPos_Stdev	信号坐标系/Signal Coordinates: 如果雷达刷入了静态参数，则该值将会在整车坐标系下输出。 If radar static parameters are flashed in, these values will be output per vehicle coordinates
	信号基本功能/Signal basic function: 目标 X、Y 坐标位置，雷达同时将会输出 X、Y 坐标位置的标准差 Object X, Y Position, meanwhile, S3CF outputs standard deviations of X & Y Position
RS_Obj[xx]_XVelAbsolute RS_Obj[xx]_YVelAbsolute RS_Obj[xx]_XVelRel_Stdev RS_Obj[xx]_YVelRel_Stdev	信号坐标系: 如果雷达刷入了静态参数，则该值将会在整车坐标系下输出。 Signal Coordinates: if radar static parameters are flashed in, these values will be output per vehicle coordinates.
	信号基本功能/Signal basic function:



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信号名称/Signal Name	信号说明/Signal Description
	目标的绝对 X、Y 速度，雷达同时将会输出 X、Y 速度的标准差 Object absolute X velocity and Y velocity, meanwhile, S3CF outputs standard deviations of X & Y velocity
RS_Obj[xx]_XAccAbsolute RS_Obj[xx]_YAccAbsolute RS_Obj[xx]_XAccRel_Stdev RS_Obj[xx]_YAccRel_Stdev	信号坐标系: 如果雷达刷入了静态参数，则该值将会在整车坐标系下输出。 Signal Coordinates: if radar static parameters are flashed in, these values will be output per vehicle coordinates. 信号基本功能/Signal basic function: 目标的绝对 X、Y 加速度，雷达同时将会输出 X、Y 加速度的标准差 Object absolute X acceleration & Y acceleration, meanwhile S3CF outputs standard deviations of X & Y acceleration.
RS_Obj[xx]_heading	信号坐标系: 如果雷达刷入了静态参数，则该值将会在整车坐标系下输出。 Signal Coordinates: if radar static parameters are flashed in, these values will be output per vehicle coordinates. 目标的航向角，若未刷入静态参数，则航向角在雷达坐标系下输出。若刷入静态参数，则航向角在整车坐标系下输出。 Object heading angle, if radar static parameters are not flashed in, heading output in radar coordinate system; if radar static parameters are flashed in, heading output in vehicle coordinate system
RS_Obj[xx]_ValidFlag	信号坐标系/Signal Coordinates: - 信号基本功能/Signal basic function: 目标输出是否有效，若无效，则目标所有相关参数均为默认值 Indicates whether object is dummy, if yes, all attributes of such objects shall be default value.
RS_Obj[xx]_MeasFlag	信号坐标系/Signal Coordinates: - 信号基本功能/Signal basic function: 输出目标的卡尔曼滤波中是否有测量值的维护。若 MeasFlag 为 False，则输出目标的卡尔曼滤波仅有预测值的维护。



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信号名称/Signal Name	信号说明/Signal Description
	Indicates whether actual measure maintenance is applied to object kalman filter. if MeasFlag is False, then object kalman filter has only predict maintenance
Classification: RS_Obj[xx]_MotionPattern	信号坐标系/Signal Coordinates: -
	信号基本功能/Signal basic function: 输出目标的运动状态，信号状态分为如下四种：未知/静止/从运动到静止/运动 Indicate object motion status, basically with 4 categories: unknown/stationary/moving to stationary/moving
Classification: RS_Obj[xx]_Type	信号坐标系/Signal Coordinates: -
	信号基本功能/Signal basic function: 雷达传感器将会输出如下目标分类： Object is classified in below types: • 4 轮车/4-wheelers • 2 轮车/2-wheelers • 行人/pedestrian • 未知/unknown

3.4.3 点云信息/Detection

在当前CAN Matrix 中，S3CF 雷达将会以 50ms 的周期输出最多 15 个（可配置）点云的信息。若点云不足 15 个，则CAN 信号将会是默认值状态输出，需要使用方法进行判定。

In currently defined CAN matrix, S3CF outputs up to 15 detection(configurable) every 50ms. If detections in environment are less than 15, CAN signals still output 15 detections with dummy ones whose attributes are set to default. To filter dummy detections, specified methodology has to be followed.

点云信息说明如下表/Detection Description Table:

信号名称/Signal Name	信号说明/Signal Description
RS_Detn[xx]_ID	信号坐标系/Signal Coordinates: -
	信号基本功能/Signal basic function: 输出点云 ID，若是无效点云，则输出的 ID=0xFF。 Detection ID, in case dummy detection, ID = 0xFF



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信号名称/Signal Name	信号说明/Signal Description
RS_Detn[xx]_PosX RS_Detn[xx]_PosY	信号坐标系/Signal Coordinates: 如果雷达刷入了静态参数, 则该值将会在整车坐标系下输出。 If radar static parameters are flashed in, these values will be output per vehicle coordinates 信号基本功能/Signal basic function: 输出点云的 X,Y 坐标位置 Detection X and Y Position
RS_Detn[xx]_XVelRel RS_Detn[xx]_YVelRel	信号坐标系/Signal Coordinates: 如果雷达刷入了静态参数, 则该值将会在整车坐标系下输出。 If radar static parameters are flashed in, these values will be output per vehicle coordinates 信号基本功能/Signal basic function: 输出点云的 X, Y 速度 Detection X & Y velocity
RS_Detn[xx]_MotnSts	信号坐标系/Signal Coordinates: - 信号基本功能/Signal basic function: 输出点云的运动状态 Detection motion status to indicate detection is moving or stationary
RS_Detn[xx]_Magn	信号坐标系/Signal Coordinates: - 信号基本功能/Signal basic function: 输出点云的信号强度 Detection magnitude to indicate detection strong or weak
RS_Detn[xx]_Qly	信号坐标系/Signal Coordinates: - 信号基本功能/Signal basic function: 输出点云的质量 BitsMap Detection quality bitmap to indicate detection confidence



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3.5 S3CF 雷达电气信息/S3CF Electrical Information

3.5.1 Pin 脚定义/Pin Definition

Pin No.	Pin 脚描述 /Name	Pin 脚类型 /Type	详细描述 /Description	备注 Notes	线束末端接线方式（若使用 MC 提供线束） Harness Terminals(if using MC harness)
1	NC	/	/	/	/
2	NC	/	/	/	/
3	CAN2_L	Communication I/O	可选，仅支持高速 CAN Optional, only HS CAN is supported	CAN2_L/第二路 CAN 低	2 号母端 DB9 的 2 脚 female DB9 2# Pin 2
4	CAN2_H	Communication I/O	可选，仅支持高速 CAN Optional, only HS CAN is supported	CAN2_H/第二路 CAN 高	2 号母端 DB9 的 7 脚 female DB9 2# Pin 7
5	GND	Ground	接地 Connect to ground	电源输入负极	4mm 黑色香蕉头 4mm black banana head
6	CAN1_L	Communication I/O	可选，仅支持高速 CAN Optional, only HS CAN is supported	CAN1_L/第一路 CAN 低	1 号母端 DB9 的 2 脚 female DB9 1# pin 2
7	CAN1_H	Communication I/O	可选，仅支持高速 CAN Optional, only HS CAN is supported	CAN1_H/第一路 CAN 高	1 号母端 DB9 的 7 脚 female DB9 1# Pin 7
8	VBAT	Power Input	接入整车 KL15 或 KL30 Connect to KL15 or KL30 power	电源输入正极	4mm 红色香蕉头 4mm red banana head



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3.5.2 供电方式说明/Power Supply

S3CF 雷达是基于车辆应用设计，支持 9V~36V 供电电压下正常工作，额定工作电压为 12V，功率为 3W。

S3CF is normally applied to vehicle with 9V - 36V supported, classic working voltage is 12V with 3W power consumption

3.5.3 线束定义/Pin Configuration

地址线定义见下

Address Pin configuration can be found in below

Radar Position	Address 1 - Pin8	Address 0 - Pin9
FMR	NC	NC

其余参考Pin 脚定义，详细机械接插件贴图如下：

For other pin configuration, please refer to Pin Definition Section. Detailed connector mechanical information can be found in below:

1-1719393-1

✓有效

Housing for Female Terminals, Wire-to-Wire, 8 Position, 4 mm [.157 in] Centerline, Sealable, Black, Wire & Cable, Power & Signal, MCON 1.2mm



MCON | MCON 1.2mm

TE 内部编号 1-1719393-1

TE 内部产品描述 8POS, MCON 1.2 LL REC SE
ALED

封装方法: Box

工作温度范围: -40 – 130 °C [-40 – 266 °F]

主要产品颜色: 黑色

混合型连接器: 否

电路应用: 电源和信号



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4 雷达安装与连接/Radar Installation & Connection

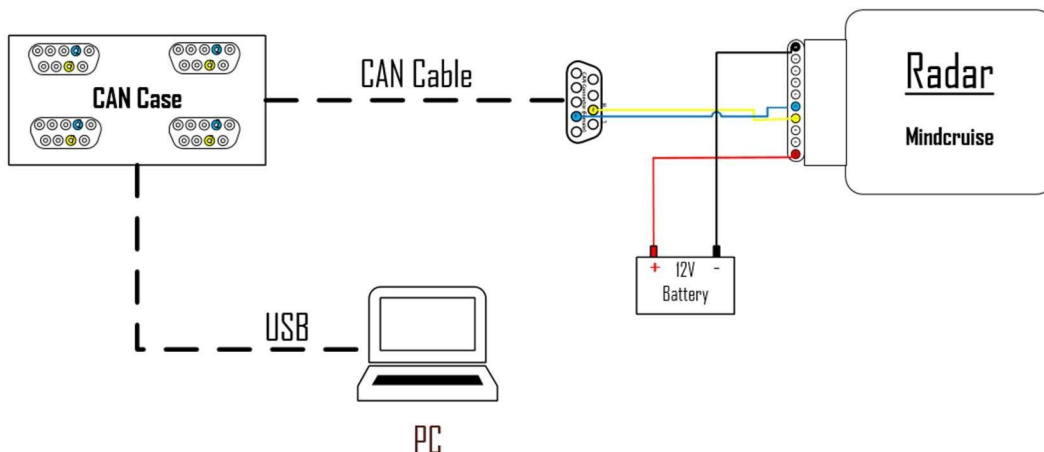
4.1 静态测试/Static Test

4.1.1 电气连接/Electrical Connection

所需物品：雷达、线束、12V 电源、CAN Case（推荐使用Vector 或PCAN-USB 系列产品）、PC 或IPC

Needed equipment: Radar, harness, 12v power supply, CAN Case(Vector or PCAN-USB), PC or IPC.

Electrical connection refer to below:



4.1.2 基础测试场景/Basic Test Scene

按照上述描述连接好系统后，可于室外空旷地带，在雷达正前方 5m 处放置一 10dBsm 的角反（角反与雷达高度需一致），观察上位机软件上雷达是否探测到目标，以确保雷达正常工作。

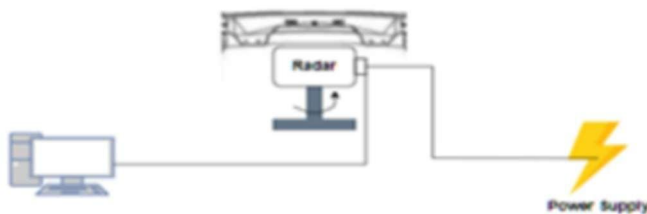
After connecting radar system per Electrical Connection section, to have a quick check whether radar is up and running, below basic test is recommended to be conducted:

find a plain & open square, place a 10dBsm reflector at 5m in front of radar(reflector height shall be the same with radar), look into radar visualizer software - Farseer(can be provided by MindCruise) to see whether there is detection.

If there is a stand still detection at around 5m in front of radar, then radar is now up and running.



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4.2 装车测试/Vehicle Test

4.2.1 雷达安装/Radar Installation

可采用以下简易万向支架安装雷达，支架一端与车辆固定，另一端安装雷达（可采用胶粘等方式）。

If vehicle test is for temporary prototype demo, then a fast type bracket can be used(see below picture). Bracket shall be screwed onto vehicle and with radar mounted in bracket via glue or other methodology.

此方式仅适用于小批量 Demo 装车，针对大批量装车情况，MC 可根据车型提供定制化支架的开发，如有需要可联系MC 销售或工程师了解具体情况。

This bracket is only applied to temporary demo car, for series mass production car, Mindcruise can offer bracket design. If needed, please contact MindCruise sales team or engineering team for detailed discussion.

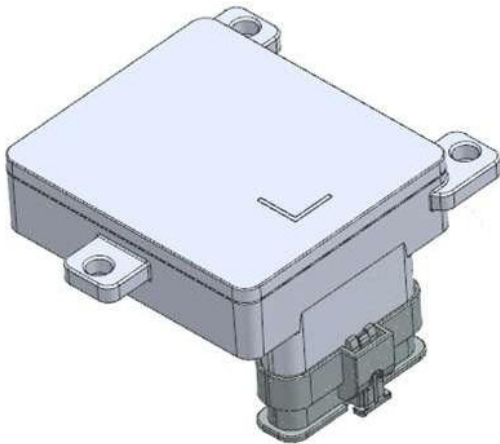




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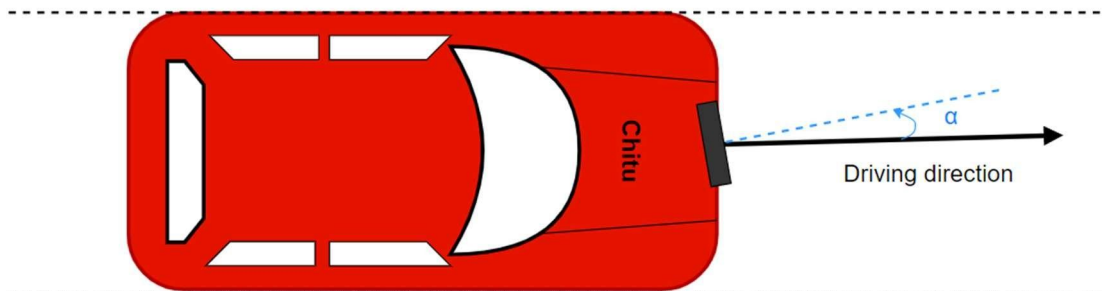
安装雷达时需注意正反，接插件端为反面，示意图如下：

When radar is being installed, head and tail sides shall be taken care of, and the connector side is the reverse side. The radar 3D diagram is as follows:



前雷达安装角经典值通常在正负 5 度以内，安装误差为正负 3 度。下图展示了一个绕俯仰轴（Z 轴）旋转的安装样例：

Typical mounting angle of front radar is within $\pm 5^\circ$ with $\pm 3^\circ$ tolerance allowed. An example is shown as below to indicate front radar mounting angle:



4.2.2 电气连接/Electrical Connection

所需物品：雷达、线束、便携式 12V 电源（也可以从整车取电）、可编程网关（推荐使用 PCAN-Router 系列产品）、CAN Case（推荐使用 Vector 或 PCAN-USB 系列产品）、PC 或 IPC

Needed equipment: Radar, harness, portable 12v power supply(or get power from car), programmable gateway (PCAN-router is recommended), CAN Case(Vector or PCAN-USB), PC or IPC.

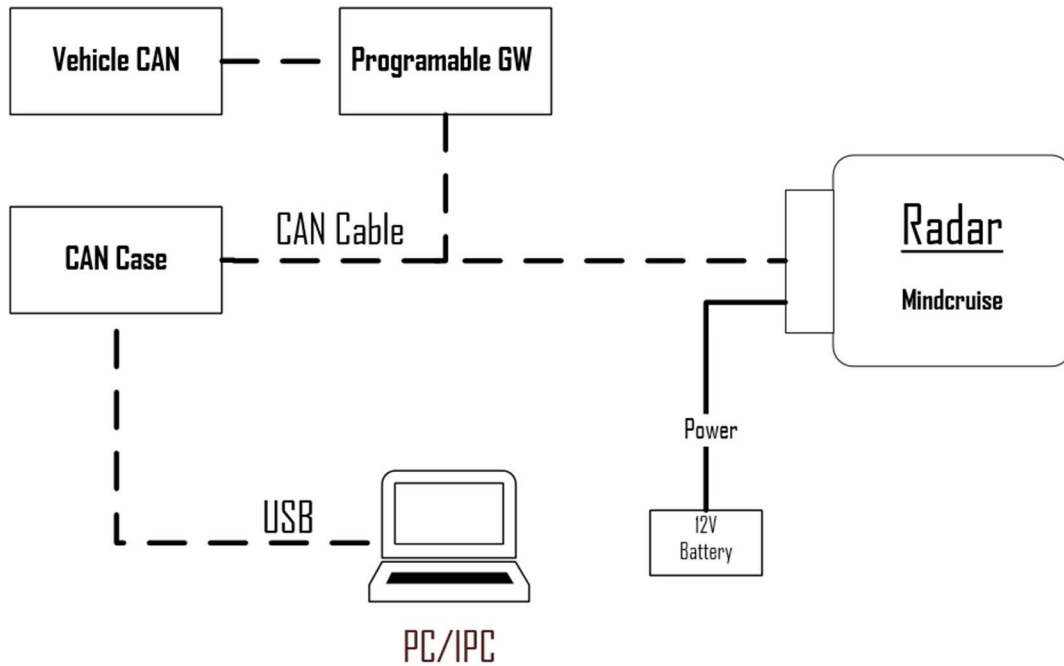
各雷达地址线连接可参考上述定义。



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Radar address pin connection shall refer to Pin Configuration section.

电气原理图如下/Electrical connection is as below:



4.2.3 网关设计/Gateway Design

明确要向雷达转发的整车CAN 信号后，需要向网关中刷写特定的软件转发信号，此处仅给出 PCAN-Router 可编程网关设计的相关操作，详见下面附件：

As every customer target vehicle has different CAN signals, to map S3CF radar signals with vehicle signals, a gateway shall be designed.

A reference gateway design example is given as below:

[PCAN-Router-FD UserMan.pdf](#)

4.2.4 雷达输入信号需求列表/Radar Needed Input Signal List

毫米波雷达需要从整车获取以下信号，以便能够进行准确的补偿和计算，以便得出准确的环境信息。

Radar needs signals from vehicle so that it can compensate vehicle dynamic status to output accurate object and detection.

请提供包含以下整车输入信息的 dbc，以便于MC 将整车信息整合到雷达系统。

Please provide vehicle dbc which at least contains below signals to MindCruise:



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雷达需求的整车输入信号	描述信息	需求等级
ESC_VehicleSpeed_Valid_indicator (车速有效位)	Host raw velocity valid indicator 主车速度有效位	Optional
ESC_VehicleSpeed (车速)	Host raw velocity 主车速度	Mandatory
GearStatus (档位状态)	Transmission position 车辆档位状态 (P,R,N,D,Valid)	Optional for Tracker Mandatory for feature
SAS_SteerWheelAngle (方向盘转角)	Steering wheel angle 方向盘转角	Optional for Tracker Mandatory for feature
YRS_LateralAccel_Valid_indicator (横向加速度有效位)	Host acceleration (y) valid indicator 主车横向加速度有效位	Optional
YRS_LateralAccel (横向加速度)	Host acceleration (y) 主车横向加速度	Optional
YRS_LongitudinallAccel_valid_indicator (纵向加速度有效位)	Host acceleration (x) valid indicator 主车纵向加速度有效位	Optional
YRS_LongitudinallAccel (纵向加速度)	Host acceleration (x) 主车纵向加速度	Optional
YRS_YawRate_valid_indicator (偏航角有效位)	Vehicle yaw rate valid indicator 主车偏航率有效位	Optional
YRS_YawRate (偏航率)	Vehicle yaw rate 主车偏航率	Mandatory

4.2.5 雷达静态参数刷写/Radar Static Parameter Flash

由于在不同车辆上，雷达安装位置各不相同，因此需要通过刷写雷达静态参数对安装位置进行申明，以便雷达的输出能整合到车辆坐标系

As radars are mounted normally in different positions for different cars, to announce radar mounting positions, radar static parameters shall be flashed in so that radar output can be consolidated into vehicle coordinate system.



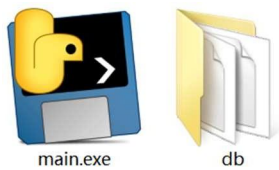
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使用静态参数刷写工具 may27（可联系MC 销售或工程师获得）对雷达进行静态参数刷写，目前该工具支持Peak 与 Vector 的硬件，具体步骤如下：

Radar static parameters can be flashed via tool called may27(can be fetched via MindCruise sales team or engineering team), currently may27 is supported by Peak or Vector hardware, detailed steps are as below:

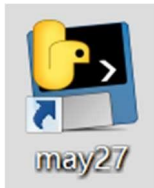
Step1 打开may27 程序所在位置，并创建 db 文件夹用于存放参数文件（若已有则跳过）

Step 1 open folder of may27, create a folder named db(if db folder exists already, then skip step 1)



Step2 打开程序

Step 2 Open may27 program

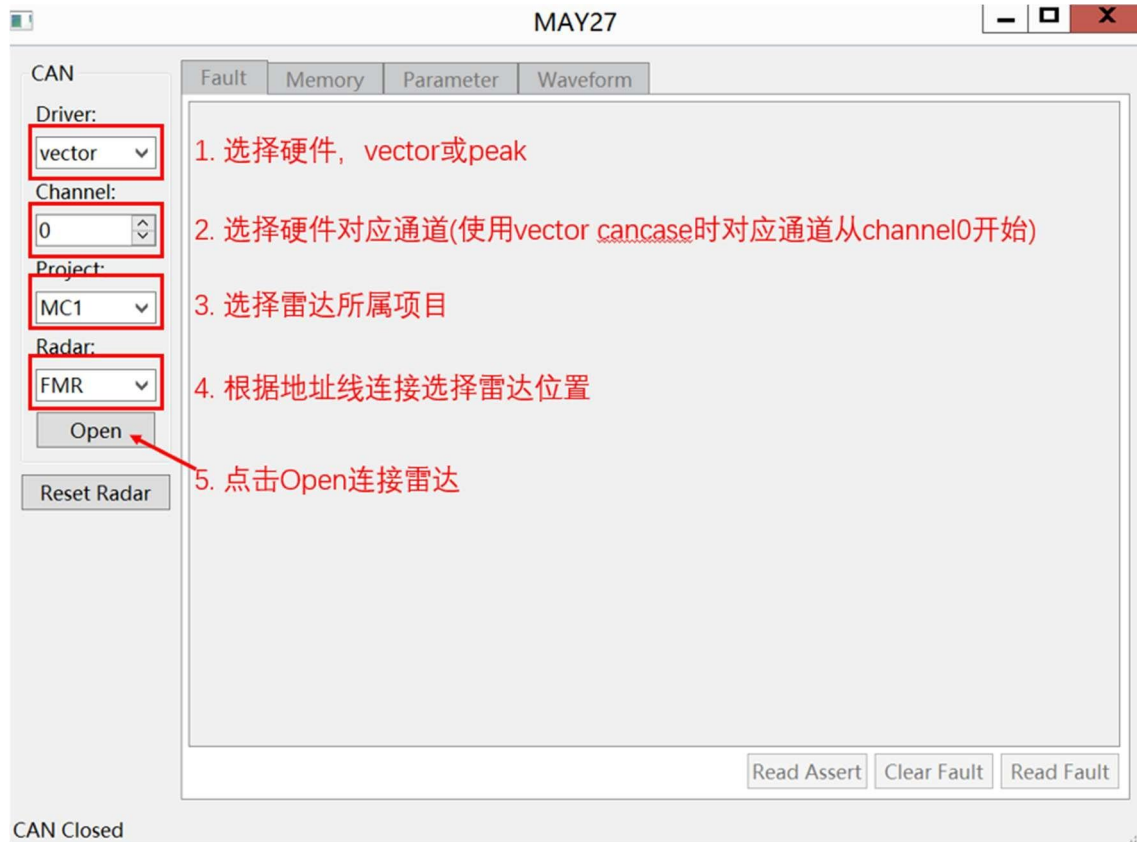


Step3 连接雷达

Step 3 Connect to radar



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Step 4 生成静态参数文件

Step 4 Generate static parameter file

Master 为左前雷达与右后雷达, Slave 为右前雷达与左后雷达;

Master indicates front left and rear right radar, slave indicates front right and rear left radar;

X,Y,Z 坐标为以车辆原点作为 (0,0,0) 的相对坐标*;

X,Y,Z coordinate system shall take original point (0,0,0) from vehicle coordinate system, more information see*

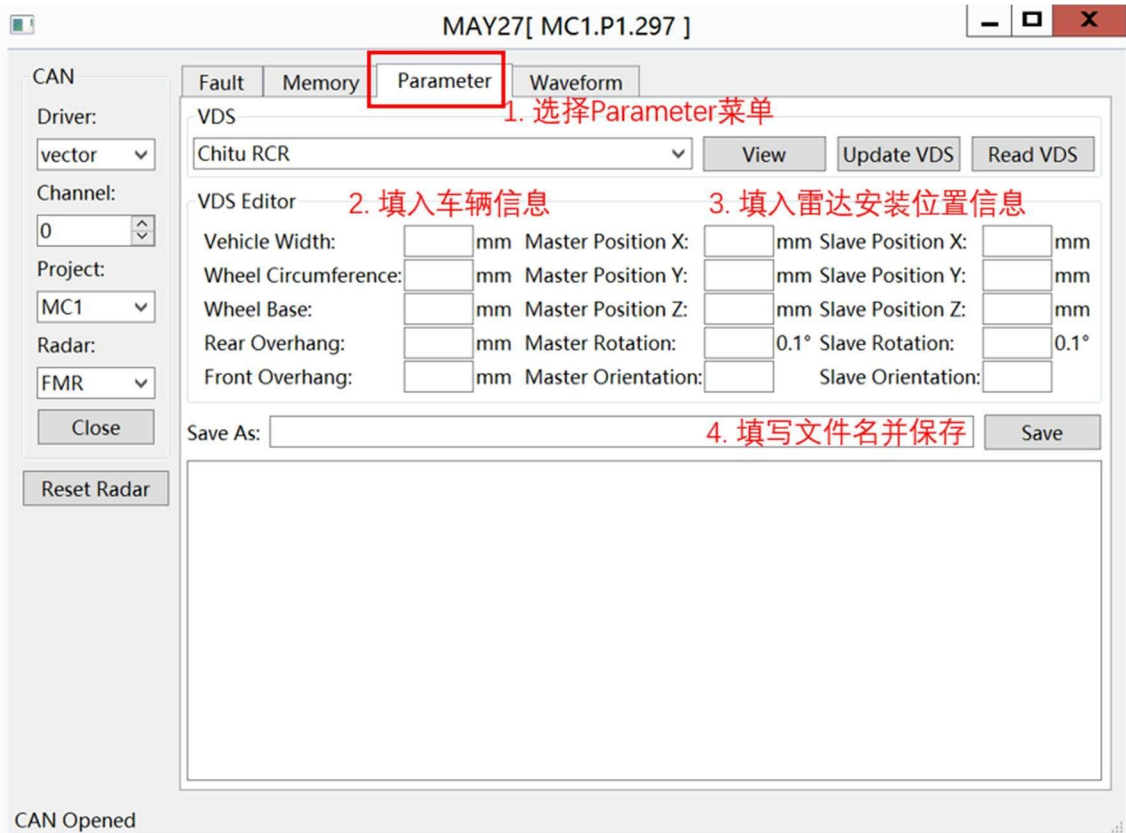
Rotation 角度为车辆纵向正方向到雷达 boresight 的逆时针角度 (见上雷达安装章节);

Rotation is the angle that defined in radar installation section

Orientation: 填写 0/ fill in with 0



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*雷达安装位置信息方向定义/Vehicle coordinate system definition:

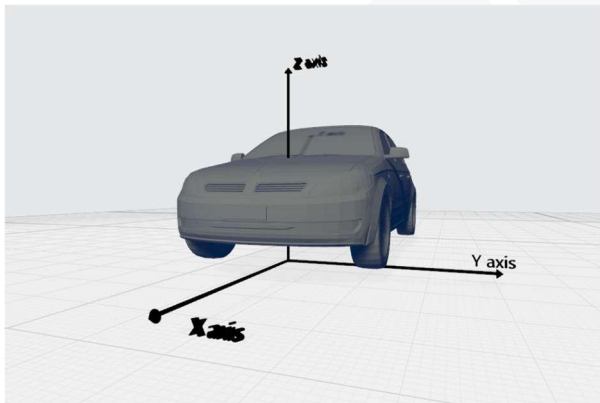


Figure 1 image2022-3-3_14-54-52.png

雷达的目标输出默认坐标系及正负如上图所示/Radar output per coordinate system shown above:

- X 轴（汽车前进方向为正）/ x axis (vehicle driving direction is defined as +)
- Y 轴（汽车前进方向左侧为正）/ Y axis (on left side of vehicle driving direction is defined as +)
- Z 轴（垂直向上为正）/ Z axis (up is defined as +)



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坐标原点（0,0,0）可以根据需求进行定制，常见为：

Original point (0,0,0) can be customized, normally it can be:

- 车辆前轴中心在地面的投影 / ground projection of vehicle front axle center
- 车辆后轴中心在地面的投影 / ground project of vehicle rear axle center
- 前保中心在地面的投影 / ground project of vehicle front bumper

建议雷达系统的坐标原点与其他传感器的坐标原点保持一致。

Suggest to keep radar output original point the same as other sensors.

Step5 刷写参数并确认

Step 5 flash in and confirm

Step6 关闭软件

Step 6 Close may27

Step7 雷达上下电

Step 7 Power off radar and then power on radar



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4.2.6 雷达静态校准/Radar Static Alignment

由于雷达安装过程中可能会出现安装误差，尤其是人工安装雷达时。

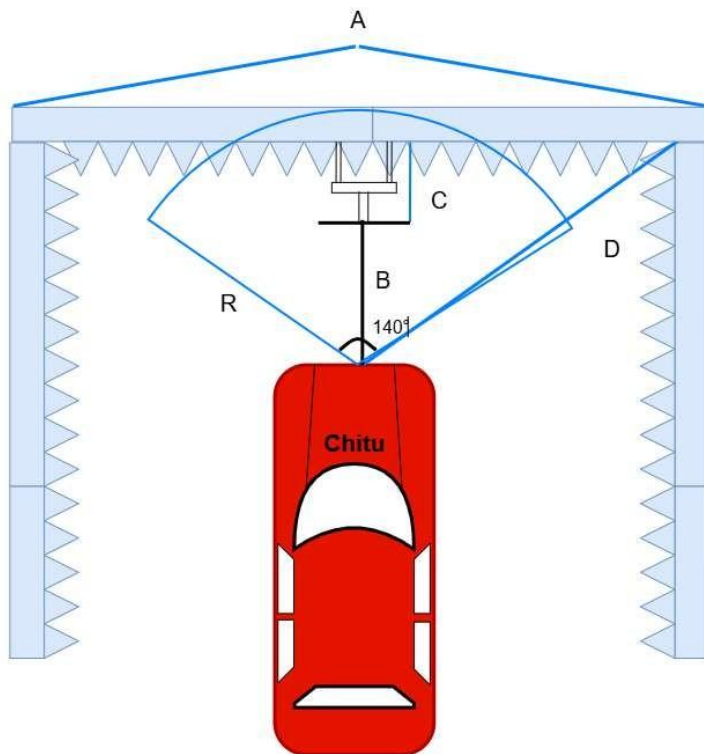
When radars are installed, there might be installation error while installation process especially when radars are installed manually.

并且这些安装误差需要检查并补偿到预定的安装位置。

And these installation errors need to be checked and compensated to pre-defined installation position.

因此需要执行静态校准。目前校准只支持正负三度以内的安装误差。

Therefore, alignment strategy is applied. Only the installation angle error of radar within $\pm 3^\circ$ can be fixed.



静态校准需要以下设备：

Below equipments are required for static alignment:

Radar 雷达

Corner reflector 角反射器

Absorber material 吸波材料

Computer with alignment tool MC Focus, CAN interface 带有校准工具的电脑，CAN 接口

使用静态校准工具MC Focus（可联系MC销售或工程师获得）对雷达进行静态校准，目前该工具支持Peak与Vector的硬件，具体步骤如下：



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Radar static alignment can be indicated via tool called MC Focus(can be fetched via MindCruise sales team or engineering team), currently MC Focus is supported by Peak or Vector hardware, detailed steps are as below:

Step 1 打开程序

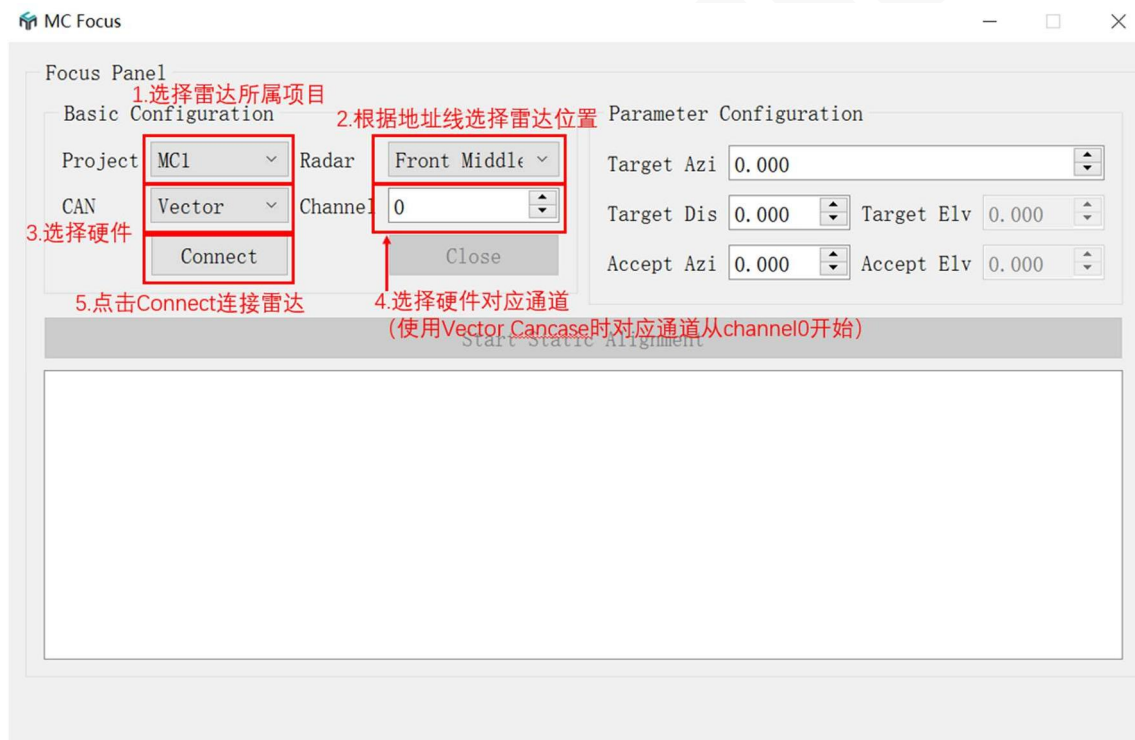
Step 1 Open MC Focus program



MC
Focus.exe

Step 2 连接雷达

Step 2 Connect to radar



Step 3 配置参数并开始校准

Step 3 Fill in parameters and start alignment



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MC Focus

Focus Panel

Basic Configuration

Project MC1 Radar Front Middle

CAN Vector Channel 0

Connect Close

Parameter Configuration

1 Target Azi 0.000

2 Target Dis 2.500 Target Elv 0.000

3 Accept Azi 3.000 Accept Elv 0.000

Start Static Alignment 4. 点击按钮开始校准

Target Azi: 角反相对于雷达的目标位置, e.g. 0°, 30°, 45°

Target Dis: 角反相对于雷达的距离 (m)

Accept Azi: 雷达对于角反的搜寻范围, e.g. 3° 表示在±3°内搜寻角反 (目前最大支持修正3°以内的误差)

校准过程大约需要 5s。

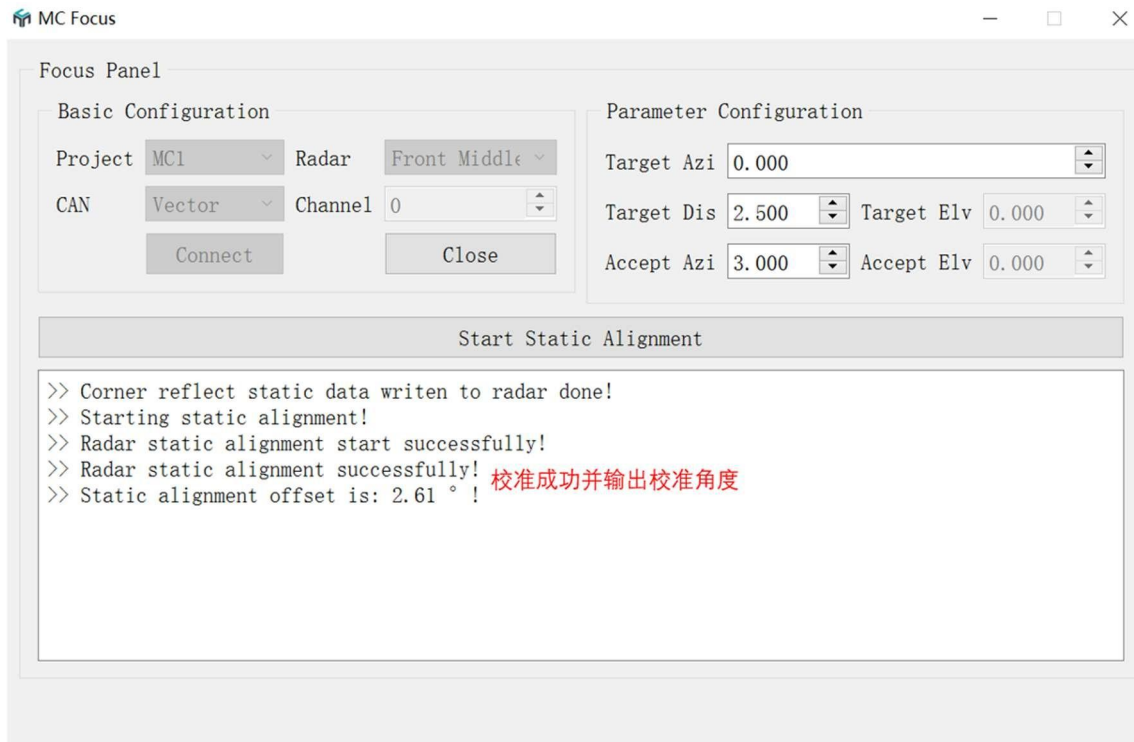
The process will last for about 5s.

Step 4 输出结果

Step 4 Output result



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Step 5 关闭软件

Step 5 Close MC Focus

Step 6 雷达上下电

Step 6 Power off radar and then power on radar

*

以下情形中静态标定可能发生失败:

The static alignment may fail or work incorrectly in below conditions:

- 角反离雷达过近
The CR is too close to the radar
- 雷达波被屏蔽
Radar beam is blocked
- 雷达安装偏差过大
Installation error is too large
- 在目标区域有比角反反射更强的物体
There is object with stronger reflection than CR in target area
- 在目标区域内有和角反径向距离相似的物体
There is object with same range with CR in target area



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5 附件/Appendix

5.1 可视化显示

Faaastseer 是MC 雷达可视化软件，用于雷达探测目标的可视化，该软件支持雷达和摄像头数据的实时显示和数据离线回放功能。

Faaastseer is MindCruise radar visualizer which is used to visualize radar output i.e. objects and detections. It supports real-time display, dta record and replay for radar & camera data.

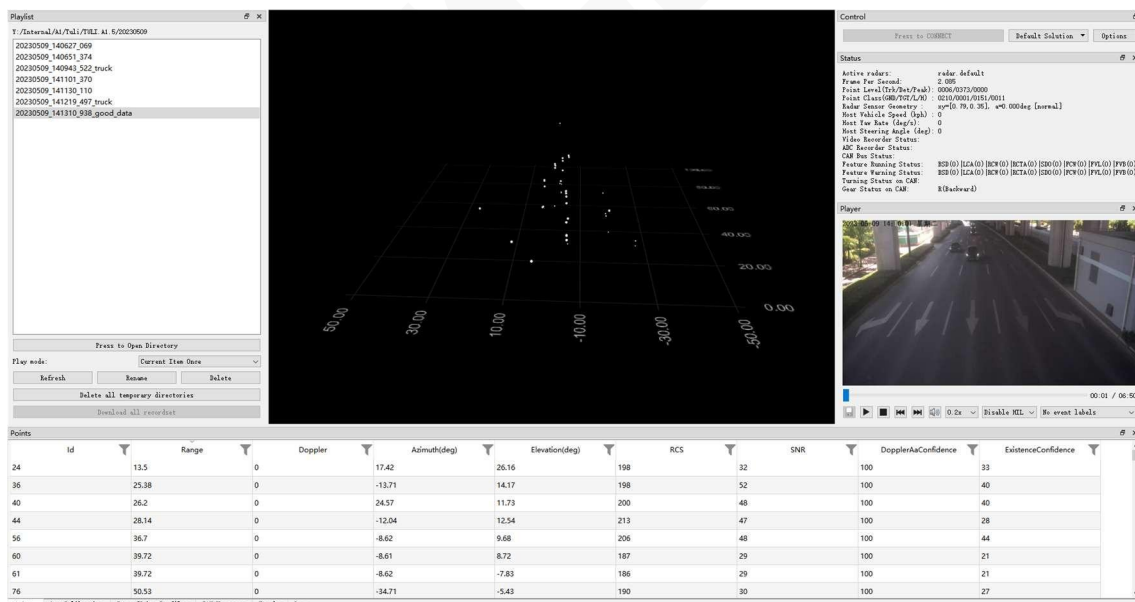
此上位机主要显示的内容包括以下内容/Major display contents:

- 雷达探测detection 及目标/Radar outputs i.e. objects, detections
- 雷达内部运行参数/Radar internal parameters
- 参考摄像头视频/Reference camera video

Faaastseer 安装包、License 及具体使用方法由MC 提供，如有需要可联系MC 销售或工程师。

Faaastseer setup pacakge, license and user guideline can be provided by MindCruise, please approach MindCruise sales team or engineering team if you need faaastseer.

上位机显示界面，如下图所示：



5.2 安装 CAN Case 驱动/Install CAN case driver

雷达的CAN 线会实时向外发送CAN 报文，为了能获取 CAN 报文，需要安装CAN 采集设备的驱动。



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Radar delivers messages via CAN, to acquire these messages, CAN tools will be needed.

以下为Peak CAN Case 信息/Peak CAN case information:

Peak CAN Case (2 路) 基本信息/Peak CAN Case (2 channels) information: [PCAN-USB-Pro-FD UserMan eng.pdf](#)

Peak CAN Case (6 路) 基本信息/Peak CAN Case(6 channels) information: [PCAN-USB-X6 UserMan eng.pdf](#)

Peak CAN Case 驱动下载链接/Peak CAN Case driver download link: <https://www.peak-system.com/PCAN-USB-X6.438.0.html?&L=1>

Vector 相关硬件信息可在Vector 公司官网查询/Vector relevant tool information: <https://www.vector.com/de/de/unternehmen/ueber-vector/>

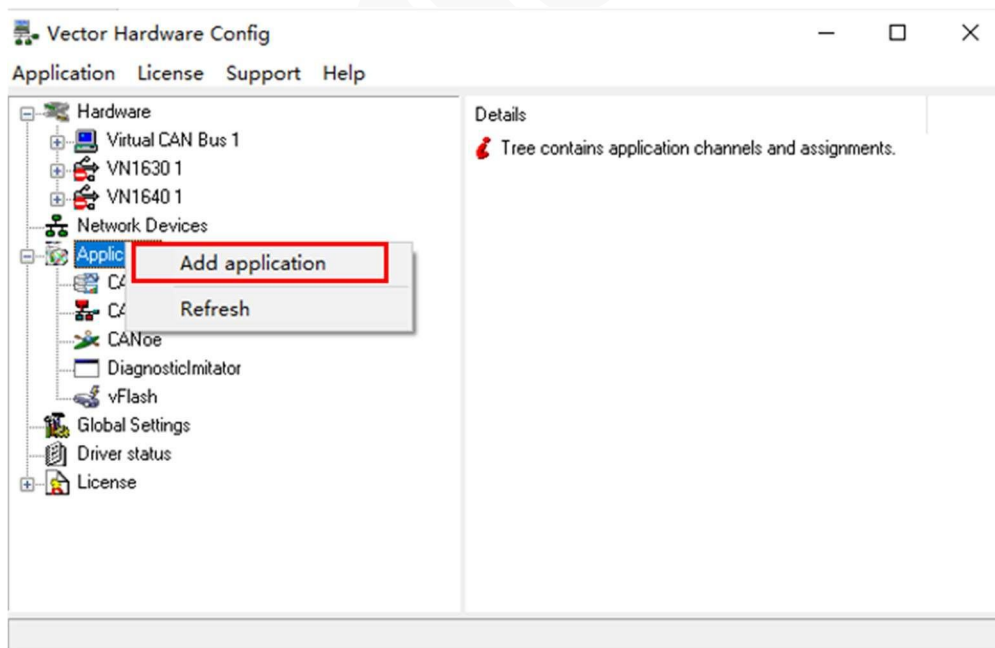
5.3 Vector 硬件驱动/Vector Hardware Configuration

使用May27 和 MC Focus 程序时适配Vector Cancase 时需要对硬件通道进行配置。

When using May27 and MC Focus with Vector Cancase, modification of Vector Hardware Configuration is necessary.

Step 1 新建应用

Step 1 Add application

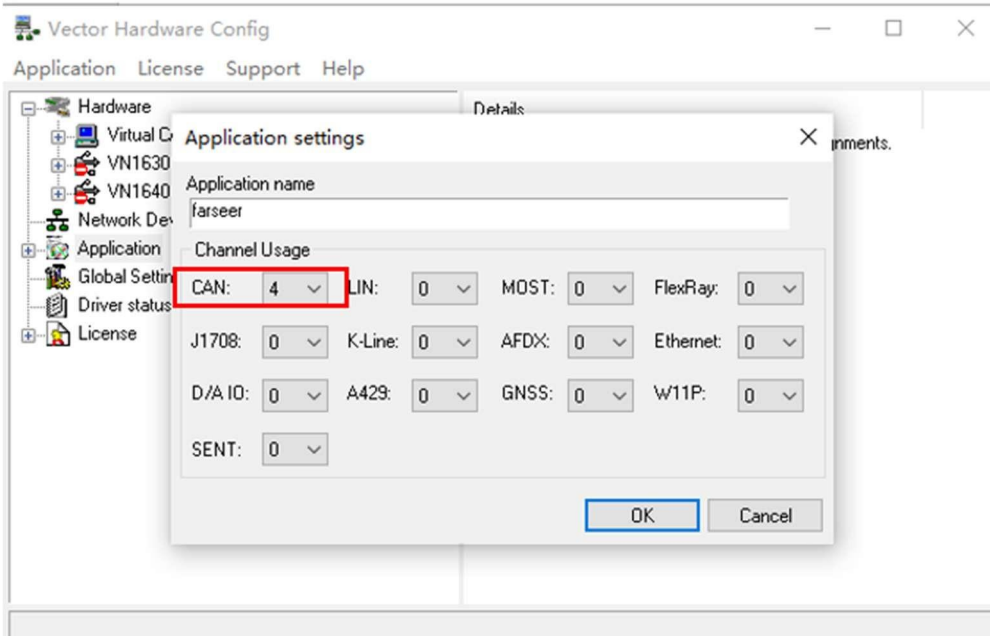


Step 2 命名farseer 并配置通道数



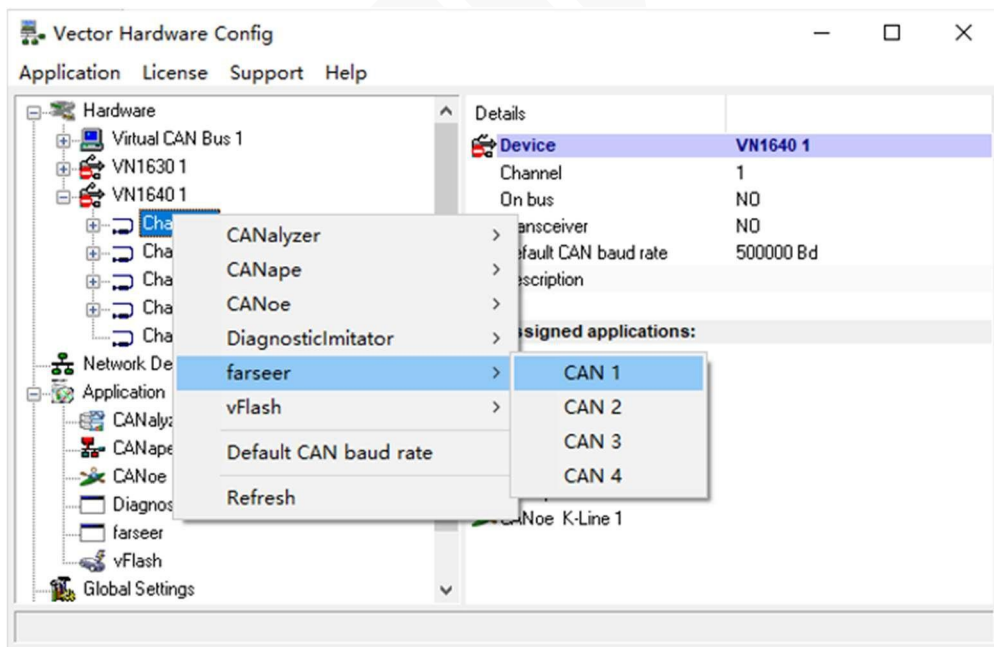
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Step 2 Name application “farseer” and configure Channel Usage.



Step 3 选择对应的硬件并添加应用

Step 3 Choose Hardware and add application to channel





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