

NAV350 中文调试手册					
类型:	调试指导				
版本:	V1.0	日期:	2017-11-26		





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1. SOPAS 软件连接

推荐用以太网连接, IP 地址默认 192.168.1.10.

Automatic IP address discovery

Custom IP address configuration

Select all

✓ 192.168.1.10

Add
Edit

可看到在线的 NAV350:



在调试过程中,可以观察 NAV 不同模式下的指示灯状态:

Status indicators

The LEDs signal the operational status of the NAV350.

The NAV350 has four LEDs. These visually signal the actual operational status and the status of the continuous self-check. The LEDs are on the front of the device on the NAV350. *tab.* 4 shows the function of the LEDs.

	Yellow	Yellow	Green LED	Red	Meaning
	LED (1)	LED (2)		LED	
	Off	Off	Off	Off	Device switched off.
					No supply voltage.
Yellow	(1) On	On	On	On	LED test for 5 s after switching on.
Yellow	(2)				The output signal switching device is active.
Green	Off	On	Any	Any	A command is being processed
Red	Off	Any	Flashing	Any	Stand by
			1 Hz		
	Off	Any	Flashing	Any	Measurement mode
			4 Hz		
	Flash-	Off	Flashing	Off	Firmware Update
	ing 4 Hz		1 Hz		
	Any	Any	Any	On	System error in the device
					For information on troubleshooting see
					section 8.3 "Troubleshooting and rectification"
					on page 60

Tab 4: Meaning of the LED status indicators

重要模式:

待机模式 Standby:绿灯每秒闪一次; 测量模式 Measurement:绿灯每秒闪四次,也就是正常导航模式。



2. 布置和学习反射胶贴

2.1. 布置反射胶贴

在布置反射胶贴时,请注意以下原则:

- a. 胶贴箭头朝向
 - 粘贴时,保证胶贴上每个小单元的箭头朝上,如下图:



 b. 平面和圆柱胶贴的尺寸 下图是制作平面胶贴和圆柱胶贴的推荐尺寸。 推荐使用圆柱胶贴,可视的角度更广。
 胶贴的高度根据现场底面的平整度而定,胶贴越高,数据越稳定。



5 - 10 cm

c. 反射胶贴与其他反光物的距离
 如下图所示,反射胶贴与窗户、玻璃或其他圆柱形反射物的距离要大于 300m;
 胶贴与胶贴之间距离要大于 500mm。



d. 反射胶贴布置不能采用对称方式 如下图右侧,对称方式布置胶贴,会导致 NAV350 坐标判断出错。



e. 胶贴与 NAV 最近距离必须大于 500mm

2.2. 通过 SOPAOS 学习反射胶贴

打开 NAV350 参数界面后,切换到用户界面,并且输入密码登陆: 密码是 client:



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È陆后,可以看到 S	canView 界面:			
SICK Device NAV350 (not define	d) Parameter View Help	ሪ # 🕆 🕞 🗃 🖬 🖩		_ 6
Sensor Intelligence.	Scan viev Image: Constraint of the second of t	0 00° 0 00 0 0 0 0 0 0 0 0 0 0 0 0 0 0	gation 2 (922: 226) = 8 [176.338] ° 4000 8000 8000 1	Partin O Act. Layer: 0 X: 0.09 Y: 0.059 Orientation: 06,51 Wean dev: 7 Pos. mode: continuous Info state: 27000 Visd refl.: 23000 Visd refl.: 23000 Visd refl.: 33
	2000			T[m] T[m] -1224 -89 913 -1014 922 933
SICK	-6000 -			selected reflector Mean app: 1554 Hit count: 15 Global ID: 2 Jype: Reflecto Subtype: flat
Sensor Intelligence.	-8000 - <			Vulity: n.a. Size: 80

接下来利用图标栏里的图标进行 NAV 的配置:

💈 🛈 鈴 昭 🖻 🕯 🕼 🗟

2.1.1. NAV 通电后,会自动进入 standby 模式,启动 NAV,等待 mapping 等设置。 也可以点击图标: ¹,进入待机模式。

2.1.2. 进入第一次 mapping 设置地图,添加胶贴。

点击图标: , 按照提示一步一步设置: Mapping assistant, Present for landmark setting:

			0				
Mapping assistant							X
Napping assistant Please enter landmark (lata relev	ant	configurati	on			
					_	1	
Preset for landma	rk dete	cti	on		_		
	min.			max.			
Action radius	500 🗘	mm		15000 🗘	mm		
N closest reflectors	0 🗘]	(″0″=	all)			
Reflector threshold	50 🗘	%					
Reflector type Ofle	t indrical	ector	diameter	100 🗘	mm		
< B	ack Nex	t >	Finish	Cancel			

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Action radius: 设置扫描半径, 500-10000, 精度可以控制在 4mm。根据精度要求, 需要把扫描半径缩短, 建议控制在 10000mm 以内。 N Closest reflectors:设置添加胶贴个数, 0 意思是添加扫毛到的所有胶贴, 5 的意思 是添加扫描到的最近的 5 个胶贴。 Reflector threshold: 反射阀值, 50 不用改。 Reflector Type: 反射胶贴类型。 Flat: 平面的。 Cylindrical: 圆柱的, 推荐使用这种。 Reflector Diameter: 直径或宽度, 需要精确,

讲λ	下一	面:
		~

	niigu acron
Preset for mapping	
Current layer	
X-Position	0 🗘 mm
Y-Position	0 🗘 mm
Orientation	0 🗘 1/1000 Grad
Number of scans for mean value c	alculation 50 🗘
negative mapping (commit on	ly new reflectors to layout)
• Replace i Usage of the result Append to	n current layer o current layer
Download data after mapping	to device immediately

Current Layer:当前层,建议用保持为0,意思是使用一个层。 *每个地图作为一个层,一个层最大可以用12000个胶贴。 **X,Y Position:**输入系统原点(工厂原点),如下图:



建议使用 NAV350 初始位置为原点: NAV 背板朝向为 x 正, 左侧为 y 正, 相对于 X 轴 逆时针为 orientation。此时, X, Y, Orientation 都为 0. Number of for mean value calculation: 确定胶贴位置要扫描 50 次, 不用修改。 Usage of the result: 结果如何使用: Replace: 第一次添加胶贴; Append: 添加新的胶贴。 Download data after..:选择自动下载。

进入 muting 页面,	一般用不到:	通过设置角	自度来屏蔽	0	
-	Mapping assistant X				
	Napping assistant Please enter sector muting relevant configuration				
	Preset for secto	or muting]		
	Muted sectors:	Begin	End		
	Sector 1	0 ° /1000	0 ° /1000		
	Sector 2	0 ° /1000	0 ° /1000		
	Sector 3	0 ° /1000	0 ° /1000		
	Sektor 4	0 ° /1000	0 ° /1000		
		< Back Next > (OK Cancel		



Mapping 完成后,点击下载地图图标 🗯 ;

2.1.3. 验证胶贴位置:

胶贴添加成功后,在 Monitor 里面,点击显示胶贴 ↓ 点击居中 ^{III},有必要的话点 击转方向 ^{III},把显示调整到自己看着舒服的角度。 左侧显示成功加入胶贴的个数,坐标等信息。 中间窗口显示 NAV 和胶贴的位置。





3. 进入导航模式

点击图标栏, C, 进入导航模式: 导航助手:

3.1. 基本参数设置

Preset for lands	ark datas	tion		
rieset for failum	ark detec	1101		
A	min.		max.	
Action radius	500 -	mm (""0".	15000 v mm	
Reflector threshold	50 0	% %	-811)	
⊂ fl Reflector type	at	tor diameter	100 C mm	
• cy	lindrical			

N Closest reflectors:设置导航用胶贴的个数。

*胶贴越多,通讯响应速度可能慢,定位精度不一定高。最少3块,建议使用4,5块。 Reflector threshold:反射阀值,50不用改。

Reflector Type: 反射胶贴类型。

Flat: 平面的。 Cylindrical: 圆柱的, 推荐使用这种。 Reflector Diameter: 直径或宽度, 需要精确,

SICK

3.2. 定位参数设置

Navigation assistant	Navigation assistant X							
Navigation assistant Please enter navigation relevant configuration								
Preset for posi	Preset for positioning							
Current layer Sliding mean depth	Current layer Sliding mean depth 1 \$ ("1"=no smoothing)							
Kadius of landmark of Start value	300 0 mm 500 0	mm;tance						
Und value Output filter of la Output mode of po	End value 300 V mm 15000 V mm;tance Output filter of landmarks seen V Onormal							
extrapolated								
Create positioning logfile								
<	< Back Next > Finish Cancel							

Sliding mean depth:保持1:滑动平均值,一般不用改。

Radius of Landmark..: 搜索胶贴的半径大小: 在距离 NAV350 500mm 的位置,在半径 300mm 内搜索;在 7000mm 的位置,也在半径 300mm 范围内搜索。在这范围内如 果没有搜索到胶贴,那么 NAV350 就会利用其它胶贴定位。

landmark filter: 输出 landmark 的个数:

Sean:看到多少输出多少; Used: 用到几块输出几块;

Expected:预期的数量。

Output mode of position:位置输出模式:

normal:发一次请求,立即就回复上一圈的位置(一般不用); extrapolated,等待扫描完成后发送数据(通常用这个模式);

3.3. 进入导航模式

点击 Next, 等待大概 1 分钟, NAV350 会进入导航模式。如下图: 观察 scan view, 定位成功后,应该显示蓝色: ScanView 中,左侧显示地图内的层信息以及所有胶贴信息; 右侧显示当前 NAV350 的坐标和角度;定位模式;定位用到的胶贴数量等信息。 移动 NAV350,可以看到胶贴位置不变,NAV350 在地图上移动,坐标也在改变。





3.4. 永久保存参数

导

航	<u> </u>									
	NAV3	50 (not def	ined)	Param	eter	View	Help			
	۵	🕹 🕹 🛛	i		5	- (G	-			
	Write all parameters to device									
	然后点击菜单里的永久保存:									
	IIAVS	Mode	ieu) iar	ame cer	- 6					<u>ل</u> ھ
		Parameter		÷		Save Perm	anent			Ē
)	Password		•		Load Fact	ory Defa	ults		
	â	Download lay	out to de	vice		Load appl	ication	default	s in device	
	8	Upload layou	t from de	vice						
	_			Jmin z (m.)					Threshold	max Ref

3.5. 添加新的胶贴方式

进入 mapping 模式,把 AGV 推到 5-10 米以外的位置,保证 AGV 可以看到之前学习的 3 块 胶贴,然后开始 Mapping。



到达下一步的时候, 选择 Nagtive mapping, 选择 Append to current layer, 只添加新的胶贴, 原有的不变:

Mapping assistant	x				
Mapping assistant Please enter mapping relevant configuration					
Preset for mapping					
Current layer					
X-Position 0 🗘 mm					
Y-Position 0 🗘 mm					
0 Crientation 0 C 1/1000 Grad					
Number of scans for mean value calculation 50 🗘					
negative mapping (commit only new reflectors to layout)					
Replace in current layer Usage of the result Append to current layer					
Download data after mapping to device immediately					
< Back Next > Finish Cancel					

*如果新学习的胶贴和老胶贴有重复,可以点击胶贴列表,可以删除重复的胶贴。

3.6. 调试下一台 NAV350

第一台 NAV350 调试完成后,可以生成一个 mapping 的配置文件,直接下载到下一台 NAV350 里就可以使用了。不用再重新做 mapping 了,步骤如下:

首先,进入 Standby 模式,点击最右侧保存图标:

Parameter View Help			1	
) 🖪 🛛 🖗 🕖 👫	12 🖻 🧯	i 🛯 🖗 🗋	ļ
Scan view				
	.0	° () •90° Op	peration mode	Standby
min min	Threshold max Reflect	or X -1.277	m Y 1.428	m d 1.916
Layer Check	x (n)			
# used layers:	1 y (m)	-1.5	-1	-0.5
LayerID # Landmarks				
0	4			



其次, 地图保存到指定目录

Save landmark	data			×
Save In: 📃	Desktop	 ~	J 💩 🌡	
篇库				
🖳 计算机 📬 网络				
📗 New				
Marka Tools				
ľ				
File Name:	Layout171123. 1mk			
Files of Type	: *.lmk			~
				[
			Save	Cancel

然后,用记事本打开文件查看内容

📃 Layout171123.lmk - 记事本							
文件(F) 编辑(E) 格式(O)	查看(V)	帮助(H	ł)				
#SICK AG #NAV Layout data #FileFormat: 1.00 #Sopas NAV350 V1.20. #Used Layers: #LayerID #landmarks # 000 4	1-18.08	8. 2015	7				
"globID x[mm] 000002 -1722 000003 918 000004 916 000005 -530	y[mm] -87 924 -1009 -1231	type 1 1 1 1	subtype 1 1 1 1	size[mm] 80 80 80 80 80	layer1 0 0 0 0	layer2	layer3

再次, 连接到新的 NAV350, 打开保存的地图文件:

Open landmark fi	le			2
Look In: 📃 D	esktop	¥	J 🖄 🖉	1
	 团队能力规划 团队例会 团队例会 管理文件 服务管理 Work Reference manual Layout171123_lask 			
File Name:	Layout171123.lmk			
Files of Type:	*.lmk, *.ref		Open	Cancel

然后,点击下载,地图就会成功下载到新的 NAV 里:



4. 初始化和导航控制

以下是初始化 NAV350 的常用指令: 前面 9 条参数设置,后面 10-13 条是导航控制内容:

顺序	指令名称	发送	返回
1	Log-in(登录设 备)	<stx>sMN SetAccessMode 3 F4724744<etx></etx></stx>	sAN SetAccessMode 1
2	Standby mode (进入待机模 式)	<stx>sMN mNEVAChangeState 1<etx></etx></stx>	sMA mNEVAChangeStatesAN mNEVAChangeState 0 1
3	Write current layer(进入当前 层)	<stx>sWN NEVACurrLayer 0<etx></etx></stx>	sWA NEVACurrLayer
4	Set sliding mean	<stx>sWN NPOSSlidingMean 1<etx></etx></stx>	sWA NPOSSlidingMean
5	Set position data format(设置数据 格式)	<stx>sWN NPOSPoseDataFormat 1 0<etx></etx></stx>	sWA NPOSPoseDataFormat
6	Set RF Window (反射板窗口大 小)	<stx>sWN NCORIdentWindow 300 300 500 80000<etx></etx></stx>	sWA NCORIdentWindow
7	Set N Closest Reflectors(最近 反射板数量)	<stx>sWN NLMDnClosest 3<etx></etx></stx>	sWA NLMDnClosest
8	Set Action Radius(设置扫 描半径)	<stx>sWN NLMDActionRadius 500 80000<etx></etx></stx>	sWA NLMDActionRadiussWN
9	Navigation mode(进入导航 模式)	<stx>sMN mNEVAChangeState 4<etx></etx></stx>	sMA mNEVAChangeStatesAN mNEVAChangeState 0 4
10	Requesting the position(每周期 数据请求)	<stx>sMN mNPOSGetPose 1<etx></etx></stx>	sMA mNPOSGetPosesAN mNPOSGetPose 1 6 1 0
11	Synchronize Timestamp(同步 时钟)	<stx>sMN mNAVGetTimestamp<etx></etx></stx>	sAN mNAVGetTimestamp 0 57D835



12	Velocity Input (每周期速度反 馈)	<stx>sMN mNPOSSetSpeed A00 B00 552E3 1EE300 1<etx></etx></stx>	sAN mNPOSSetSpeed 0
13	Requesting the position(每周期 数据请求)	<stx>sMN mNPOSGetPose 1<etx></etx></stx>	mNPOSGetPosesAN mNPOSGetPose 1 0 1 1 FFFFFF5 FFFFDD7 3A728 1 1 67A00 4 1 E7000501 3

4.1. 常用指令详解

4.1.1. 以 client 账号 Log-in(登录设备) 发送指令: <STX>sMN SetAccessMode 3 F4724744<ETX> 解释: 以 client 账号登录设备,密码 client:

Command part	Description	Туре	Range/Value
Command type	Request (SOPAS method by name)	String	sMN
Command	Set user level	String	SetAccessMode
NewModel	User level code	Int_8	2 = operator 3 = authorized client
Password	Password Hash Value	UInt_32	00000000 FFFFFFF

反馈: sAN SetAccessMode 1 解释: 登陆成功。

Command part	Description	Туре	Range/Value
Command type	Request (SOPAS answer)	String	sAN
Command	Set user level	String	SetAccessMode
Success	Mode successfully set	Bool_1	0 = no
			1 = yes

4.1.2. 进入 Standby mode (待机模式)

发送指令: <STX>sMN mNEVAChangeState 1<ETX> 解释: 进入 Standby 模式:

Request

Command Syntax: sMN mNEVAChangeState mode

(according: SA, DA, UA, RA, MA, PA, PN)

Command part	Description	Туре	Range/Value
Command type	Request (SOPAS method by name)	String	sMN
Command	Set operating mode	String	mNEVAChangeState
Mode	Number of valid operating mode.	Enum_8	0 = power down
			1 = standby (Default)
			2 = mapping
			3 = landmark detection
			4 = navigation



反馈 1: Acknowledge

Response (Method Acknowledge)

Command Syntax: sMA mNEVAChangeState

Command part	Description	Туре	Range/Value
Command type	Response (SOPAS method acknowledge by name)	String	sMA
Command	Asynchronous Method Set Operating mode	String	mNEVAChangeState

反馈 2: 内容。

Response after Execution

Command Syntax: sAN mNEVAChangeState errorCode mode

Command part	Description	Туре	Range/Value
Command type	Response (SOPAS answer)	String	san
Command	Set Operating mode	String	mNEVAChangeState
ErrorCode	Error number	Enum_8	0 = no error 1 = invalid change 2 = method break 3 = unknown operating mode 5 = timeout 6 = method break; another command is active 7 = general error
Mode	Operating mode after execution	Enum_8	0 = power down 1 = standby 2 = mapping 3 = landmark detection 4 = navigation

4.1.3. Write current layer(设置层)

发送: <STX>sWN NEVACurrLayer 0<ETX>

解释: 进入 layer 0.

因为 NAV350 一个层可以录入 1 万多个胶贴,所以建议不要使用额外的层。

Command part	Description	Туре	Range/Value
Command type	Request (SOPAS write by name)	String	sWN
Command	Set current Layer	String	NEVACurrLayer
CurrLayer	Layer number	UInt_16	0 319
			(Default: 0)

反馈: sWA NEVACurrLayer



Command Syntax: sWA NEVACurrLayer

Command part	Description	Туре	Range/Value
Command type	Response (SOPAS write by name)	String	sWA
Command	Set current Layer	String	NEVACurrLayer

4.1.4. Set sliding mean 设置平滑值

发送: <STX>sWN NPOSSlidingMean 1<ETX>

解释:设置 Sliding Mean 为 1.

Command part	Description	Туре	Range/Value
Command type	Request (SOPAS write by name)	String	sWN
Command	Set sliding mean	String	NPOSSIIdingMean
SlidingMean	Smoothing factor	UInt_8	1 63
			(Default: 1)

反馈: sWA NLMDActionRadiussWN

Command Syntax: sWA NPOSSIidingMean

Command part	Description	Туре	Range/Value
Command type	Response (SOPAS write by name)	String	sWA
Command	Set sliding mean	String	NPOSSIIdingMean

4.1.5. Set position data format(设置数据格式)

发送: <STX>sWN NPOSPoseDataFormat 1 0<ETX>

Command Syntax: sWN NPOSPoseDataFormat outputMode showOptParam

Command part	Description	Туре	Range/Value
Command type	Request (SOPAS write by name)	String	sWN
Command	Set positioning data format	String	NPOSPoseDataFormat
OutputMode	If set to 1 the NAV350 extrapolates the calcu-	Enum_8	0 = normal
	lated position data to the point in time of transmission.		1 = extrapolated (Default)
ShowOptParam	Select the transmission of the optional parameter	Bool_1	0 = suppressed (Default) 1 = enabled

反馈: sWA NPOSPoseDataFormat 数据格式根据客户控制需求而设置。 Command Syntax: sWA NPOSPoseDataFormat

 Command part
 Description
 Type
 Range/Value

 Command type
 Response (SOPAS write by name)
 String
 sWA

 Command
 Set positioning data format
 String
 NPOSPoseDataFormat

4.1.6. Set RF Window(反射板窗口大小)

发送: <STX>sWN NCORIdentWindow 300 300 500 80000<ETX>

Command Syntax: sWN NCORIdentWindow winLow winHigh distLow distHigh (according: PF)

Command part	Description	Туре	Range/Value
Command type	Request (SOPAS write by name)	String	sWN
Command	Define Reflector Identification Window	String	NCORIdentWindow
WinLow	Window radius in mm at distLow	UInt_16	100 2000 mm (Default: 300 mm)
WinHigh	Window radius in mm at distHigh	UInt_16	100 2000 mm (Default: 300 mm)
DistLow	Distance in mm at winLow	UInt_32	500 70 000 mm (Default: 500 mm)
DistHigh	Distance in mm at winHigh	UInt_32	500 70 000 mm (Default: 70 000 mm)

反馈: sWA NCORIdentWindow

Command Syntax: sWA NCORIdentWindow

Command part	Description	Туре	Range/Value
Command type	Response (SOPAS write by name)	String	sWA
Command	Define Reflector Identification Window	String	NCORIdentWindow

4.1.7. Set N Closest Reflectors(最近反射板数量)

发送: <STX>sWN NLMDnClosest 3<ETX>

解释:设置定位用的最少反射胶贴数量为3。

Command syntax: sWN NLMDnClosest nClosest

(according: PC)

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Command part	Description	Type	Range/Value
		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	ininge/ terms
Command type	Request (SOPAS read by name)	String	sWN
command type	nequeet (connorcad by name)	oung	
Command	Set N closest reflectors	String	NLMDnClosest
NClosest	Quantity of N closest reflectors	UInt_8	0 40
			(Default: 0)
			(Delault. V)

反馈: sWA NLMDnClosest

Command syntax: sWA NLMDnClosest

Command part	Description	Туре	Range/Value
Command type	Response (SOPAS read by name)	String	sWA
Command	Set N closest reflectors	String	NLMDnClosest

4.1.8. Set Action Radius(设置扫描半径)

发送: <STX>sWN NLMDActionRadius 500 80000<ETX>

注释:最近 500mm,最远 80000mm。



(according: PO)

Command syntax: sWN NLMDActionRadius rFr rTo

Command part	Description	Туре	Range/Value
Command type	Request (SOPAS read by name)	String	sWN
Command	Set Action Radius	String	NLMDActionRadius
RFr	Minimum Actions Radius	UInt_32	400 70 000 mm (Default: 500)
RTo	Maximum Action Radius	UInt_32	400 70 100 mm (Default: 70 000)

Response

Command syntax: sWA NLMDActionRadius

Command part	Description	Туре	Range/Value
Command type	Response (SOPAS read by name)	String	sWA
Command	Set action radius	String	NLMDActionRadius

Request Read

Command syntax: sRN NLMDActionRadius

Command part	Description	Туре	Range/Value
Command type	Request (SOPAS read by name)	String	sRN
Command	Request action radius	String	NLMDActionRadius

Response

Command syntax: sRA NLMDActionRadius rFr rTo

Command part	Description	Туре	Range/Value
Command type	Response (SOPAS read by name)	String	sRA
Command	Request action radius	String	NLMDActionRadius
RFr	Minimum Actions Radius	UInt_32	400 70 000 mm
RTo	Maximum Action Radius	UInt_32	400 70 100 mm

4.1.9. Navigation mode(进入导航模式)

发送: <STX>sMN mNEVAChangeState 4<ETX>

解释:进入导航模式。

Request

Command Syntax: sMN mNEVAChangeState mode

```
(according: SA, DA, UA, RA, MA, PA, PN)
```

Command part	Description	Туре	Range/Value
Command type	Request (SOPAS method by name)	String	sMN
Command	Set operating mode	String	mNEVAChangeState
Mode	Number of valid operating mode.	Enum_8	0 = power down
			1 = standby (Default)
			2 = mapping
			3 = landmark detection
			4 = navigation



4.1.10. Requesting the position (每周期数据请求) 发送: <STX>sMN mNPOSGetPose 1<ETX> 此步骤需要每 125ms 发送一次,因为 NAV350 的扫描频率是 8 次每秒。 请注意,发送平率过高胡导致收到乱码。 收到的数据格式,请参考 4.1.13 节。 Command Syntax: sMN mNPOSGetPose wait (according: PP, PV, Pv, Pw)

Command part	Description	Туре	Range/Value
Command type	Request (SOPAS method by name)	String	sMN
Command	Position Request	String	mNPOSGetPose
Wait	If set to 1 the NAV350 waits for the next calculated position data. If set to 0 the NAV350 respond the position result instantly, valid at the timestamp in the pose response	Bool_1	0 = instantly last pose result 1 = wait for next pose result

Response (Method Acknowledge, indicates NPOSGetPose has started)

Command Syntax: sMA mNPOSGetPose

Command part Description		Туре	Range/Value
Command Type	Response (SOPAS method acknowledge)	String	sMA
Command	Get pose	String	mNPOSGetPose

4.1.11. Synchronize Timestamp(同步时钟) 发送: <STX>sMN mNAVGetTimestamp<ETX> 此命令用于控制系统和 NAV350 进行时钟同步。

Command Syntax: sMN mNAVGetTimestamp

Command part	Description	Туре	Range/Value
Command type	Request (SOPAS method by name)	String	sMN
Command	Sync Timestamp	String	mNAVGetTimestamp

Response

Command Syntax: **sAN mNAVGetTimestamp** errorCode timestamp

Command part	Description	Туре	Range/Value
Command type	Response (SOPAS answer)	String	sAN
Command	Sync Timestamp	String	mNAVGetTimestamp
ErrorCode	Error number	Enum_8	0 = no error 1 = invalid operating mode 7 = general error
Timestamp	Internal NAV350 timestamp	UInt_32	04 294 967 295 ms (0xffffffff)

4.1.12. Velocity Input (每周期速度反馈)



发送: <STX>sMN mNPOSSetSpeed A00 B00 552E3 1EE300 1<ETX> 此命令为了达到更高的定位精度。

Response

Command Syntax: sAN mNPOSSetSpeed errorCode

Command Syntax: sAN mNPOSSetS- peed errorCode Command part	Description	Туре	Range/Value
Command type	Response (SOPAS method by name)	String	sAN
Command	Set Velocity of the NAV350	String	mNPOSSetSpeed
ErrorCode	Error code	Enum_8	0 = no error 1 = wrong operating mode 3 = parameter out of range 7 = general error

Command Syntax: **sMN mNPOSSetSpeed** X Y Phi timestamp coordBase (according: PV, Pv, Pw)

Command part	Description	Туре	Range/Value
Command type	Request (SOPAS method by name)	String	sMN
Command	Set Velocity of the NAV350	String	mNPOSSetSpeed
X	X-component of velocity in the coordinate system defined by <i>coordBase</i>	Int_16	-32 000 +32 000 mm/s
Y	Y- component of velocity in the coordinate system defined by <i>coordBase</i>	Int_16	-32 000 +32 000 mm/s
Phi	Angular velocity of the NAV350	Int_32	-360 000 +360 000 mdeg/s
Timestamp	Timestamp of the Velocity vector related to the NAV350 clock	UInt_32	04.294.967.295 ms (0xffffffff)
CoordBase	Coordinate system of the velocity vector, local or global	Enum_8	0 = local coordinate system of the NAV350 1 = absolute coordinate system

4.1.13. Requesting the position (每周期数据请求) 发送: <STX>sMN mNPOSGetPose 1<ETX>

二次读取 NAV350 的位置数据:

Command Syntax: sMN mNPOSGetPose wait

(according: PP, PV, Pv, Pw)

			-
Command part	Description	Туре	Range/Value
Command type	Request (SOPAS method by name)	String	sMN
Command	Position Request	String	mNPOSGetPose
Wait	If set to 1 the NAV350 waits for the next calculated position data. If set to 0 the NAV350 respond the position result instantly, valid at the timestamp in the pose response	Bool_1	0 = instantly last pose result 1 = wait for next pose result



Response (Method Acknowledge, indicates NPOSGetPose has started)

Command Syntax: sMA mNPOSGetPose

Command part Description		Туре	Range/Value
Command Type	Response	String	sMA
	(SOPAS method acknowledge)		
Command	Get pose	String	mNPOSGetPose

Response after Executing mNPOSGetPose

Command Syntax: **sAN mNPOSGetPose** version errorCode wait poseData [pose data [x y phi] optPoseData [outputMode timestamp meanDev navMode infoState quantUsedReflectors]]

Com	mand part		Description	Туре	Range/Value
Com	mand type		Response (SOPAS method by name)	String	sAN
Com	mand		GetPose	String	mNPOSGetPose
Versi	on		Version of POSE Data	UInt_16	0000 FFFF
Error	Code		Error code	Enum_8	0 = no error 1 = wrong operating mode 2 = asynchrony Method terminated 3 = invalid data 4 = no position avail- able 5 = timeout 6 = method already active
					7 = general error
Wait			If set to 1 the NAV350 waits for the next calculated position data. If set to 0 the NAV350 respond the posi- tion result instantly, valid at the timestamp in the pose response	Bool_1	0 = synchronous: last position result 1 = asynchronous: new calculated position
Pose	Data		Set to1, if pose data follow	UInt_16	0 = no pose data 1 = pose data follow
	X		X-Position	Int_32	-10 000 000 +10 000 000 mm
ata	Y		Y-Position	Int_32	-10 000 000 +10 000 000 mm
se D	Phi		Orientation	UInt_32	0360000 mgrad
Po	OptPoseData		Set to 1, if optional pose data follow	UInt_16	0 = no optional data 1 = optional data follow
	OPD	output- Mode	Data are instantly or extrapolated	Enum_8	0 = instantly 1 = extrapolated

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	Time- stamp	Timestamp	UInt_32	04 294 967 295 ms (0xffffffff)
	Mean- Dev	Mean deviation	Int_32	0 2000 mm
	Nav-	Position mode	Enum_8	0 = initial positioning
	Mode			1 = continuous positioning
				2 = virtual positioning
				3 = positioning stopped
				4 = position invalid
				5 = external
	InfoState	Diagnosis Information	UInt_32	Information is shown in
				the table below
	NumUse	Number of used Reflectors	UInt_8	040
	dReflec-			
	tors			

诊断信息:

InfoState

Bit					Description
Ох	00	00	01	00	No external speed available
Ox	00	00	02	00	No internal speed available
Ox	00	00	04	00	Internal prediction used
Ox	00	00	08	00	Simple prediction used
Ox	00	00	10	00	No prediction used
Ох	00	00	20	00	No speed compensation done
Ox	00	00	40	00	Not enough landmarks in layer
Ох	00	00	80	00	No landmarks available
Ox	00	01	00	00	Not enough landmarks in layer for initialization
Ох	00	02	00	00	Not enough landmarks available
Ox	00	04	00	00	Less than 3 landmarks used
Ох	00	08	00	00	Positioning failed
Ox	00	10	00	00	Positioning reinitialized with internal speed
Ох	00	20	00	00	Positioning reinitialized
Ox	00	40	00	00	Positioning reinitialized
Ох	00	00	00	01	Position is extrapolated
Ox	00	00	00	02	Filter operating radii was skipped
Ox	00	00	00	04	Filter sector muting was skipped
Ox	00	00	00	08	Filter NClosest was skipped
Ox	01	00	00	00	Speed computation done
Ох	02	00	00	00	Prediction done
Ox	04	00	00	00	Correlation done
Ох	08	00	00	00	Reinitialized
Ox	10	00	00	00	Reinitialized
Ох	20	00	00	00	Landmark selection done
Ox	40	00	00	00	Positioning done
Ох	80	00	00	00	Positioning finished

4.2. 位置数据转换

注释:反馈的数字是 16 进制,直接用计算器转换成十进制。

举例:角度43.58.

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🗌 计算器					4	⇒ [이 개류해	F					$ \Rightarrow$		
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31				15				0	31	000	0 0	000	0000	1010	1010	0100	0101
							1	1									
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◎ 二进制	RoL	RoR	C	7	8	9	1	%	© /\i	制	<u> </u>						
						_			○ 二进	制	RoL	RoR	C	7	8	9 /	%
 四字 	Or	Xor	D	4	5	6	*	1/x		_	_						
									© me	<u> </u>	0-	Vee	D	4	E	C	1/

负值,要用十六进制减去最大值 FFFFF:

举例: -285mm

查看(V)	编辑(E)	帮助(<u>H</u>))												
			FI	FFF	FFFI	FFFF	EE3							-	-285
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 ● + 才 ○ + 进 ○ 八 进 ○ 二 进 	 法制 計制 計制 手制 手制 	() toL RoR	A B C	мс ← 7	MR CE 8	MS M+ C ± 9 /	· M- √ %	 ○ 十六〕 ● 十进; ○ 八进; ○ 二进; 	进制 制 制 制	() () oL RoR	A B C	мс ←	MR I CE	MS M+ C ± 9 /	· M- √

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