TraceNet Command[™] Application Suite

User Guide





TraceNet Command[™] Application Suite

Contents

Page

4	Introduction	2
ו כ	Application Launchor	2 2
2	General Eurotionality	۲
J Л	Status Monitor Application	J
4	4.1 Introduction	+۲ ۸
	4.1 Introduction	+۲
5	Alarm List (Historian)	
J	5.1 Introduction	5
	5.2 Use Instructions	5
6	Circuit Viewer	
0	6.1 Introduction	0 6
	6.2 Use Instructions	0
7	Trend (Historical) Plotter	0
1	7.1 Introduction	7
	7.1 Introduction	7
Q	Tomporature View Application	، 10
0	8.1 Introduction	10
	8.2 Use Instructions	10
٥	8.2 Use Instructions	10
9	0.1 Introduction	11
	9.2 Database	11 12
	9.5 Types	۲۲ 12
	9.4 Objects	13 14
	9.0 LINKS	
10	Sotraint Editor	10 1 <i>5</i>
10		15



1. Introduction

TraceNet[™] Command is an application software suite that produces an agile and powerful control and monitoring network for industrial heat trace systems. Using a SQL database and the Data Concentration Device (DCD), TraceNet[™] Command can be run from any computer workstation connected to the network, enabling operators to access information and customize reports much more readily. Each application is tailored to a specific task, and works with a user-friendly interface. Communication flows through the DCD and enables smooth integration into existing Industrial Ethernet Networks. The SQL Database continuously stores operational data from all networked controllers, allowing simultaneous access of data by multiple operators without impacting system performance.

2. Application Launcher

Launcher is the tool from whicht all TraceNet[™] Command's applications can be launched (Figure 1):

Applications

- Status Monitor
- Circuit Viewer
- Alarm Lists
- Set-point Editor
- Trend Plotter
- Temperature View
- Plant Editor

Tools

- DCD Telnet (remote access)
- Backup/Update (remote access)
- Modbus Test

It also handles communications between the apps (e.g. broadcasting a selected item). Closing Launcher will not affect performance of the applications, but they will lose the ability to send information to each other.



Figure 1: The TraceNet Command Application Launcher

3. General Functionality

The following features are common for Tree View in all applications that feature a left tree view:

- 1. Searching: The result of the search on the tree is stored under Search Results (Figure 2).
- 2. Broadcasting: Right-clicking an item in a list usually gives two options: "Copy to clipboard" and "Broadcast selection" (Figure 3). Broadcasting will send the selected item to the Search Results of the trees of all other TraceNet Command applications that are open. Note that this feature works only when the launcher is running, since the launcher functions as the communication hub.

Help				
devtest D- Location D- Process	2016	+ Apr	18	÷E
User TCM18		Location	Process	TC1
- TC1818	1			TC18
TC1818	2			TC18
- TC202	3			TC18
TC202	4			TC18
Search Results	•			
2	÷.			

-	IM	•	1		MIL		Selec
	III	1					
TCM18	8	ckt1 8	TH1	devtest	30108	1	Act
TCM18	7	ckt1	Broadc	ast selection		1	Act
TCM18	6	ckt1	Copy to	1	Act		
TCM18	5	ckt1		P 1 1	20105	1	Act
TCM18	4	ckt1_4	TH1	devtest	30104	1	Act
TCM18	2	ckt1_2	TH1	devtest	30102	1	Act
TCM18	1	ckt1_1	TH1	devtest	30101	1	Act

Figure 3: Broadcast Selection

Figure 2: Tree View - Search Result



4. Status Monitor Application

4.1 Introduction

The Status Monitor provides an at-a-glance overview of all heat tracing data points. All data points are time-stamped, and the oldest and newest time points for each DCD section are displayed. This provides immediate feedback on the communication status of the entire plant, since timestamps of all points will fall between the oldest and newest displayed (Figure 4).

The Staus Monitor also monitors the synchronization between the setpoint database and the controllers. Each setpoint has a request column and a last value column in the database. Immediate feedback on setpoint writes is available viewing the status app database columns. When a new request does not yet equal the last value read from the controller, the number non-synced is incremented for each such point. After some time, when the DCD devices have synchronized the database with the field devices, the last value column will equal the request column and the setpoint is synced. The DCD's will attempt to synchronize the controllers indefinitely. This mechanism provides a reliable way of writing thousands of setpoints.

	Time	Age	Device	Comsrv	Database	Number
Now	2016-04-18 12:07:07					
					devtest	
Oldest Controller	1969-12-31 18:00:00	16909 days 17:07:07	1	1	Points	598
Newest Controller	2016-04-01 13:00:38	16 days 23:06:29	22	1	Synched	488
Oldest DB Synch	2016-04-01 13:01:05	16 days 23:06:02		1	Non-Synched	0
Newest DB Synch	2016-04-01 13:01:05	16 days 23:06:02		1	Value-Error	110
		121.17.21.7273.3C.0350.02.71				
				-		
				-		

Figure 4: Status Monitor Application

4.2 Use Instructions

In addition to the status view, this app provides one other function: from the menu, under DB, a list of non-synced or value-error points can be generated for reference (Figure 5).

	DB	ID	Name	Item	llser	Value	Request	Location	Process	TC1818	•	List Non-Synched	1
		10501			100000000	1.000000000000	1000000000	Location				List Value-Error	Now
1	devtest	40501	rtd5_1	hta	1680000000	1680000000.0	1680000000.0						
2	devtest	40501	rtd5_1	ntt	1680000000	1680000000.0	1680000000.0						Oldest Cont
s •	devtest	40501		Ita	1680000000	1680000000.0	1680000000.0						Newest Con
•	devtest	40502		nta	1680000000	1680000000.0	1680000000.0	<u>.</u>		<u>8</u>	=		Oldeet DB S
)	devtest	40502		ntt	1680000000	1680000000.0	1680000000.0						Videst DB 3
0 7	devtest	40502		Ita	1680000000	1680000000.0	1680000000.0						Newest DB 3
/	devtest	40503	rta5_3	nta	1080000000	1680000000.0	1680000000.0						
5	devtest	40503	rtd5_3	ntt	1680000000	1680000000.0	1680000000.0						
9	devtest	40503		Ita	1080000000	1680000000.0	1680000000.0						
.0	devtest	40504	rtd5_4	nta	1680000000	1680000000.0	1680000000.0			-			
1	devtest	40504	rtd5_4	ntt	1080000000	1680000000.0	1680000000.0	-					
2	devtest	40504	rtd5_4	Ita	1080000000	1680000000.0	168000000.0			-	-		
8 P	ages (110 L	ines)	-	H	•	1	- H	S	elect: Non	e			

Figure 5: Status Monitor Lists

5. Alarm List (Historian)

5.1 Introduction

The Alarm List (Historian) allows generation of alarm lists for the time period specified in the time-date range selector. If one or more alarms occur more than once during the time period selected, the number of transitions is denoted in the Transitions column. Alarm codes are summarized in the Codes column. The first letter in a code hints at the alarm type (e.g. temperature alarms begin with a T, current and ground alarms begin with a C and G respectfully).

devtest	2016	는 Apr :	14	3 🕂	00:00		elect	200	16 ÷	Apr -	18	: : : :	1:59	Done 18/7	18			
(E) Process (E) User	1	Location	Process	TC1818	Controlle		OKT Nr	Tag	Codes	DB	ID	Transitions	Alarm Status	Temperature	DT	Time Last	Heater Current	Ground
E TCM18	1	W255CONA		TC1818	TC1818:	TC1818 :	12	ckt2_12	TH	devtest	30212	1	Active	148.9(80.0)	-58.9	Out of selected range	0.1	1.8
TC1818	2			TC1818	TC1818:	TC1818	1	ckt2_1	CH	devtest	30201	1	Active	73.0(80.0)	7.0	Out of selected range	0.1	7.2
- TC202	3			TC1818	TC1818	TC1818 ;	2	cke2_2	CH	desteat	30,202	1	Active	74.6[80.0]	5.4	Out of selected range	0.1	45
a TC101	4			TC1818	TC1818:	TC1818 (6.	ckt2_6	F	devtest	30206	1	Acknowledged	142.9[80.0]	-62.9	Out of selected range	0.0	1.8
- Search Results - Complete Tree	-				1 Pages	s (4 Lines)	X		14		6.	-	1	Select: None	_	. Det	2	

Figure 6: Alarm List Application

5.2 Use Instructions

- From the tree view that is provided on the left side of the application, 1. select the item(s) for which to generate the alarm history (Figure 7). Hold shift or control to select multiple items.
- 2. From the time-date range selection, select the start time and the end time for the alarm report and click the "Select" button (Figure 8). The alarm history of the selected time-date range will be shown. The "Select" button will change to a "Cancel" button while it is loading alarm history. The loading can be cancelled using this button, if desired.

Help	24			
devtest Execution Process	2016	∴ Apr	18	38
User		Location	Process	TCL
- TC1818	1		-	TC18
TCIBIR	2			TC18
- TC202	3			TCH
-TC202	4			TC18
- TC101				
Search Results				
Complete Tree				
	*			
6 I	-			Г



Figure 8: The Alarm List Time-Date Selection



The meaning of the alarm codes are explained in Legend

under the Help menu (Figure 10).



120	TCLUB			
15	TC1818	1		TC18
	TC1818	2		TC18
ė	TC202	3		TCIE
	TC202	- 4		TC18
l é	TC101			
12	Search Results			
1.5	Complete Tree			
		2.1		
				_
6	1	7		
12	J	·		
[201	6-04-18 13:35:52] Hello			
		_		
				_
	Eigure 7: The	Norm Lie	t Tran View	
	Figure 7. The			<i>v</i>
2	Click on a colu	imp titlo	to cort the	lict
J.	CIICK OIL & COIL			: 1151
	based on that of	column.		

- 4. Click on a column label to sort.
- 5. Use the previous (\blacktriangleleft) , next (\blacktriangleright) , first (\blacksquare) , and last (\blacksquare) buttons on the bottom of the page to move through multiple pages of the result list. The entire (sorted) result list can be saved using the save button (Figure 9).

СН	Current High	~
	Current Low	
	Circuit Fault	
GH	Ground Current High	
TE	Power Off	
	Tama and un Link	
TL	Temperature Low	
		-



6.

Figure 10: The Alarm List Legend

6. Circuit Viewer

6.1 Introduction

The Circuit Viewer displays and organizes circuit information in a quick, easy to use format, employing both numeric and graphic interfaces to provide information. For each circuit selected – the graphs will automatically update and scale to display the information of current, temperature, and ground current – high and low alarms, trips and current set points and readings.

6.2 Use Instructions

 As in the previous applications, use the tree view on the left side of the application. Select the item(s) from which to examine the circuit information. Hold shift or control to select multiple entries (Figure 11).



Figure 12: Circuit Viewer: Annunciator Pane

3. Click on any line item, and a detail panel of information will be displayed below. The graphs will reset and will display the circuit information in current, ground current, and temperature. This lower expanded detail panel will also show the time stamp of the last information sent from that controller about that circuit (Figure 13).



Figure 14: Circuit Viewer: Set Point Edit



Figure 11: Circuit Viewer: Tree View

2. On the right side of the window, the circuit annunciator panel will show the various circuits associated with the items selected from the tree view (Figure 12).



Figure 13: Circuit Viewer: Individual Circuit Information

4. In the annunciator panel, in the right hand column of each parameter, entering in a new value and clicking enter will tell the controller to change the parameter to the entered value. The columns on both right and left will turn red, indicating that the parameter is different between controller and request. It will turn green once the controller has acknowledged and reported that the parameter value has been changed (Figure 14).

7. Trend (Historical) Plotter

7.1 Introduction

The Trend Plotter app allows plotting of historical data (Figure 15). Different data fields can be selected and plotted together by clicking on the selection grid. An offset and multiplier can be applied to a data type to facilitate plotting in the same graph. This allows, for example, temperature and heater current to be graphed together without losing resolution.



Figure 15: Trend Plotter Application

1. From the tree view select an item. This will enable related tabs on the bottom right of the application (Figure 16).

	Enabl	Disabled									
RTD_TC1818		Circu	it_TC1818	RTD_	TC20	2	Circuit_TC202				
	Scale		Offset	rtd2_1	rtd2_2	rtd2_3	rtd2_4	rtd2_5	rtd2_6	rtd2_7	
hta	1		0	-	+	-	+	*	-		
Ita	1		0		<u>.</u>	<i>.</i>	-	2 14	3		
temp	1	0		-		2				-	

Figure 16: Trend Plotter - Tabs

RTD_TC	1818	Circu	it_TC1818	RTD_	TC20	2	Circuit_TC202				
	Scale		Offset	rtd2_1	rtd2_2	rtd2_3	rtd2_4	rtd2_5	rtd2_6	L Chan	
hta	1		0	-		27.0	-	-	~	-	
Ita	1		0	4	-	: 4	-20	-	9	-	
temp	1		0	1	1	1	-	+	÷	+	

Figure 17: Trend Plotter - Select Items

- 2. Select plot item(s) from the enabled tabs by clicking on the grid fields (Figure 17).
- Select the start and end time from the time-date selection and click the "Select" button (Figure 12). As explained in Alarm List, the loading process can be cancelled by clicking the "Cancel" button (Figure 12). The plot will be shown when the loading is complete.



4. The legend can be turned on and off using the "Show Legend" checkbox in the plot toolbar (Figure 18).

in onon eegena prom	- I I + Show Major ond Lines	s I Show Minor Grid Lines Clear S	election
Zoom:	Pan:	Reset Vie	w

Figure 18: Trend Plotter - Toolbar



Figure 20: Trend Plotter - Legend Position

6. Use the "Show Major Grid Lines" and "Show Minor Grid Lines" checkboxes to turn on and off the major grids (black lines) and the minor grids (red lines) of the plot (Figure 21).

- 8 -



Figure 21: Trend Plotter - Grid

- 7. Use the "Clear Selection" button to deselect all selected items (Figure 17).
- 8. Use "Zoom" and "Pan" sliders to zoom into the plot or move it up and down. The view can be reset using the "Reset View" button (Figure 18).
- Add and offset and scale to a data type to change the plot as desired. Figure 22 shows an example of the original
 plot and the resulting plot after adding 144 to the offset and increasing the scale to 2. Note that the legend shows
 the offset (+) and the scale (×) values in front of the data type.



Figure 22: Trend Plotter - Scale and Offset



8. Temperature View Application

8.1 Introduction

The Temperature View app makes a bar-graph plot of all temperatures in a selection (Figure 23). This allows a single view of all temperatures in a certain area, process, or other selection.



Figure 23: Temperature View Application

8.2 Use Instructions

- 1. This app is simple to use. Just select the item from the Tree View.
- 2. The red area on the plot is the alarm range. The green area is the secure range for the temperature, and the blue circle is the last known temperature for the device (Figure 24).



Figure 24: Temperature View Application - Color Meaning

9. Plant Editor

9.1 Introduction

The Plant Editor allows the user to make changes to the database such as rename, add, or delete objects. The editor also allows modification of how objects are inter-related (Figure 25).



Figure 25: Plant Editor

9.2 Database

1. The first page contains the tools to connect the app to a database. It also has a black screen that shows a history of actions taken in the app in green text, and errors in red text (Figure 26).



Figure 26: Plant Editor - Output Screen

- 2. The first dropdown list on this page has a list of servers that are already saved. To add or remove servers click the "Edit Server List" button. In the new window (Figure 27):
 - a. Add a new server: Insert the information of the new server and click the "Add" button.
 - b. Remove a server: Select a server from the list and click the "Remove" button.

10.0.1.2	Server IP:
10.16.220.26 10.16.220.30 10.16.220.55	Username:
10.16.220.99 127.0.0.1	Password:
	Add Remove Cancel

Figure 27: Plant Editor - Edit Server List



- 3. To connect the app to a database:
 - a. Select a server from the first dropdown list on the first page of the app (Figure 28), then click "Get Database List." This action will show a list of databases available on the selected server in the second dropdown list on this page.
 - Select the database that you want to connect to from the second dropdown list and click "Connect To Database" (Figure 29).
 - c. If the connection is successful, the IP of the server and the name of the database will appear on the top of the page in green text (Figure 30).

Database Types Objects Links	Process
Server: None Database: None	
10.16.220.55	Get Database List
Edit Server List	
Databases From Server: 10	.16.220.55
ALP_EHT_1818_202	Connect To Database
devtest mysql performance_schema plot	

Figure 29: Plant Editor - Connect To Database

*			Get Database List	
*		-		
10.0.1.2				
10.16.220.2	26			
10.16.220.3	30			
10.16.220.	5			
127 0 0 1	19			
127101011			Connect To Database	
1		 		

Figure 28: Plant Editor - Get List of Databases

Database	Types	Objects	Links	Process
Server: Databas	10.16.2 e: dev	220.55 test		
Dutubuo	0. 001			
10.16.220.	55		•	Get Database List
	Edit Sen	ver List		
Databas	es Fro	m Serv	er: 10 1	16 220 55
devtest				Connect To Database
_	_	_	_	

Figure 30: Plant Editor - Successful Connection

9.3 Types

On this page, you can add a new type to the database, or rename an existing type. Type member is also handled on this page (Figure 31).

	1	Cieste ?	інні Туре			Imerie Type	SENSOR	i.	- Add lin	m To Selected 1	type	Delete Sele
	Construction Cresilt, TC3818		Typeld	Item	DataType	ItemType	DisplayGroup	DisplayType:	DisplayName	LowLink	HighLink	Sysch
	Circuit_TC302	1	34	siamos	int	SENSOR	1	Ð	Alarma	168000000.0	168000000.0	Yes
	Circuit, 15ML	2	34	simock	int .	REMOTE SETPOINT	None	None	None	Nore	None	Ves
	RTD TCION	1	- 14	carep	Final	CENCUS ALLOCAT	None	101	Friend Connect	160000000.0	Listonoooo p	Ves
	RED_TC202		34	hca	ficat	REMOTE SETFORM	1	102	High Current Alarm	0.6	158000000.0	Yes
	RED TOMB	6	н	hoursent	fiest	SENSOR	2	303	Hester Current	14800000000.0	14800000000	Yes
21.	TCIO	7	34	heater_enable	int	REMOTE SETPOINT	None	None	None	None	None	Yes
	TC1818	8	34	hgca	ficat	REMOTE SETPOINT	1	102	High Ground Current Alarm	2480000000.0	168000000.0	Ves
or 📗	TCMB	9	-34	htron	int.	SENSOR	None	None	None	None	None	Yes
- 11	TSML	10	- 14	Sca	fieat	REMOTE SETPORT	12	100	Low Current Alarm	0.0	15800000000	Vec
- 11	ANTER O	11	- 24	m	fleat	LOCAL SETPORT	1	201	Manton Temperature	1440000006.0	1900000000	Yes
		11	34	tci	fleat	REMOTE SETPOINT	1	0	Control Sand	188000000000000000000000000000000000000	1840000000.0	Ves

1. Add a new type: Input the name of the type in the textbox on the top left side of the page and click "Create New Type" (Figure 32).



Figure 32: Plant Editor - Create New Type

2. Rename a type: Select the type for the list box on the left side of the page and click the "Rename Type" button. In the new window input the new name for the type and click "OK" (Figure 33).



Figure 33: Plant Editor - Rename Type

- Add a new type member: Select the kind of the type member from the dropdown list (Figure 34), and then click "Add To Selected Type." The name of the new type member, by default, is ITEM_X (X: next available number). You can change the name or other fields of the type member by clicking on the cell and entering or selecting the new values (Figure 35).
- 4. Delete a type member: Select the item(s) and click "Delete Selected Item."

SENSOR	▼ Add It	em To Selected 1	Гуре
	yName	LowLimit	HighLimit

Figure 34: Plant Editor - Add Type Member

	TypeId	Item	DataType	ItemType	DisplayGroup
1		ITEM_1	float	SENSOR	0

Figure 35: Plant Editor - Rename Type Member

9.4 Objects

On this page, you can add, rename, or remove objects (Figure 36).

tabase Typ	es Objects Links Process					
Pt CANMedi	ntor 💽		Add	Locate	Delete	
	CANMediator	Circuit_TC101	Gircuit_TC1818	Circuit_TC202	Grouit_TCM18	Grout_TSM1
1		ckt3_1	cH12_1	del_1	del_1	ckt5_1
2			ckt2_2	clast_2	cke1_2	ckt5_2
3			cks2_3		(Lash	ckt5_3
4			c842_4		ckt1_4	ckt5_4
5			cH2_5		det	ckt5_5
6			ckt2_6		ckt1_6	ckt5_6
7			ckt2_7		ckt1_7	ckt5_7
8			cit2_8		ckt1_8	ckt5_8
9			GH2_9		642.9	ckt5,9
10			ckt2,10		ckt1_10	ckt5,10
11			ckt2_11		cke1_11	ckt5_11
12			ckt2,12		041_12	ckt5_12
13			ckt2_13		cit1_13	cit5_13
14			ckt2_14		ckt1_14	ckt5_14
15			ckt2_15		041_15	(415,15
16			ckt2_16		cit1_16	cit5_17
17			ch2_17		cet1_17	ckt5_18
18			ckt2_38		ckt1_15	ckt5_19
19			1000 Million 100			ckt5_20
20						cH15_21
21						ckt5_22
22						ckt5,23

Figure 36: Plant Editor - Objects



- 1. Add a new object: There are two ways to add a new object to a specific type:
 - a. Select the type from the dropdown list on the Objects page and Input the name of the new object in the textbox next to the dropdown list, and click "Add" (Figure 37).
 - b. Under the column of the type, click an empty cell and input the name of the new object. Press Enter or click on the other parts of the page to add the object.
- Locate an object: To find an object of a specific type in the grid view, select the type from the dropdown list (Figure 35), input the object name in the textbox next to the "Locate" button and click "Locate" (Figure 38).
- 3. Rename an object: Click on object cell in the grid view to switch to edit mode, and then input the new name for the object (Figure 39).
- Delete an object: Select the object(s) in the grid view and click the "Delete" button on the top of the page. It is also possible to switch the object's cell into edit mode and delete the name.

🙆 THR	2 THR_PlantEditor						
About	About						
Datab	ase Types Objects	Links Process					
Туре	CANMediator	•		Add			
	CANMediator Circuit_TC101 Circuit_TC1818	Â	Circuit_TC101	Circu			
	Circuit_TC202		ckt2				
	Circuit_TCM18						
	Circuit_TSM1						
	CommChannel						
	CommSenverAlmClient		1				

Figure 37: Plant Editor - Select a Type

ñ c	Locate
	Circuit IC202

Figure 38: Plant Editor - Locate Object

<u>•</u>		Add
VMediator	Circuit_TC101	Circuit_TC1
	ckt1	
	ckt2	
	ckt3	
	ckt4	

Figure 39: Plant Editor - Rename Object

9.5 Links

Objects can be linked or unlinked on this page (Figure 40).

elected As Parent Set Selected As Child	Parent CANMediator	-	Set As Parent	Link	- Charles -		
NUTRI	Child CANMediator		<u>.</u>	Set As Child	Unlink	- Gidar (
ation cosing_water phenol_transfer fuel_tank fuel_transfer # nch Results mplete Tree							

Figure 40: Plant Editor - Links

- 1. Add parents and children: Parents and children can be added to the grid view in two ways:
 - a. From the tree view select the item(s) and click "Set Selected As Parent" or "Set Selected As Child" (Figure 41). The column labels are the parents and the row labels are the children (Figure 42).



Figure 41: Plant Editor - Set Parent and Child

Figure 42: Plant Editor - Set Parents and Children

- b. From the dropdown lists select the types for parent (child). A list of available objects will appear in the dropdown list in next to the type dropdown list. Select the object and click the "Set As Parent (Child)" button (Figure 42).
- Link two objects: Every cell on the grid view is a possible link between the object as the column label (parent) and the object as the row label (child). Links are shown with X (Figure 43). To link (unlink) the objects simply double click on the cell or select the cell(s) and click the "Link" ("Unlink") button.
- 3. Clear the grid: To clear the grid and select a new set of parents and children, click the "Clear" button

9.6 Use Instructions - Page 5 (Process)

This page shows a list of the processes running on the databases. Use "Update Process List" to update the list. To kill a process, select it from the list and click the "Kill Process" button (Figure 44).



Figure 43: Plant Editor - Linking

Trode										
Database Types Objects Links Process										
Update Process List					3	Kill Process				
	ID	USER	HOST		DB	COMMAND	TIME	STATE	INFO	
1	1477	root	10.16.220.65:57980		devtest	Sleep	3		None	
2	14343	roct	10.16.220.98:49	647	devtest	Query	0	None	SHOW PROCESSUIST	
3										
4										
5										
6										
2										

Figure 44: Plant Editor - Process

10. Setpoint Editor

The Setpoint Editor allows viewing and changing of all set-points and their history. This editor also makes it easy to change many items at once. There is a batch function that allows writing the same values to any selection of objects and there are file import/export options. When set-points are changed there is feedback on the Status Monitor app. When the number of non-synced set-points reaches zero, all changes have been successfully carried out.

- 15 -



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