



RPCT Monitoring and Tuning System (MATS) User Manual

RadICS

(Radiy FSC — FPGA-based Safety Controller)

Document D11.8

Version V5, Revision R3

April 2024

CONFIDENTIAL INFORMATION

Contents

Contents.....	2
1 Introduction	6
1.1 Scope and Purpose of this Document	6
1.2 Applicability and Version Information	7
1.3 Reference Standards.....	7
1.4 Other Documents Referenced by this User Manual.....	7
1.5 Definitions and Acronyms	8
1.6 Notation in this UM:	8
1.7 Bullets:	9
2 Certification and Management of Functional Safety.....	10
3 General Operation of MATS and the Monitor.....	11
4 Configuring Monitor Displays of UAL Schemas.....	13
4.1 Basic Concept of Application Logic Schema Displays in Monitor	13
4.2 Basic Concept of Monitor and Tuning Schema Displays in Monitor	17
4.3 Use of JavaScript in Monitor and Tuning Schemas Design	22
5 Configuration of the MATS	25
5.1 RPCT Design-Time Settings.....	25
5.2 Archive Properties.....	28
5.3 MATS Services Command Line Arguments	29
5.3.1 Configuration Service Command Line Arguments	30
The user can use one of the following.....	30
keys to run Configuration Service:.....	30
5.3.2 Application Data Service Command Line Arguments	33
The user can use one of the following.....	33
keys to run Application Data Service:.....	33
5.3.3 Archive Service Command Line Arguments	35
The user can use one of the following.....	36
keys to run Archive Service:	36
6 Using the Monitor	39
6.1 Main Monitor Screen	43
6.2 Schema Selection to Display.....	47
6.3 Signal Details Window	51
6.4 Tuning in Monitor.....	57
6.5 Logging in to the Monitor Client	60
7 Signals Snapshot.....	62
7.1 Filtering	62
7.2 Updating or Freezing the Dynamic Data	65
7.3 Additional Features	66
8 Archive	69
8.1 Signals Selection	69
8.2 Archive Report Settings	73
8.3 Updating or Exporting Archive Report	75
9 Trends.....	81
9.1 Signals Selection	81
9.2 Trend Configuring.....	84
9.3 Trend View Settings.....	91
9.4 Signal Analysis Tools	93
9.5 Trends Export and Import	96
10 Supplementary Screens	98

10.1	Settings Dialog	98
10.2	” ? “ features	Ошибка! Закладка не определена.
11	Cyber Security	107
12	Product Support	108
13	Revision History	109

Figures

Figure 3-1	Data Flow Between LM and MATS	11
Figure 4-1	Display Defaults for Input, Output and In/Out Blocks	14
Figure 4-2	Display Properties for Input, Output and In/Out Blocks in RPCT	15
Figure 4-3	UAL Schematic Showing Editing for Monitoring in RPCT	17
Figure 4-4	Resulting Monitor Display	17
Figure 4-5	Monitor Schema Design Items	18
Figure 4-6	Monitor Schema Example (1)	20
Figure 4-7	Monitor Schema Example (2)	20
Figure 4-8	Monitor Schema Example (3)	21
Figure 4-9	Resulting Monitor Schema	22
Figure 4-10	JavaScript Architecture in RPCT	22
Figure 4-11	Item Script Properties Window	23
Figure 4-12	RPCT Scripts Editor	24
Figure 5-1	Monitor Configuration in RPCT	26
Figure 5-2	Configuration Service Configuration in RPCT	26
Figure 5-3	Application Data Service Configuration in RPCT	27
Figure 5-4	Archive Service Configuration in RPCT	27
Figure 5-5	Configuration Service Batch File	33
Figure 5-6	Application Data Service Batch File	35
Figure 5-7	Archive Service Batch File	38
Figure 6-1	Windows Local Services Screen	39
Figure 6-2	Configuration Service Console	40
Figure 6-3	Application Data Service Console	40
Figure 6-4	Archive Service Console	41
Figure 6-5	Example of a Monitor Schema Displayed in Monitor	42
Figure 6-6	Main Monitor Screen at Startup	43
Figure 6-7	Monitor with List of Schemas and a Single Schema Tab	47
Figure 6-8	Monitor with Two Schema Tabs Opened	48
Figure 6-9	Dropdown Schema Selection List	48
Figure 6-10	Monitor with The Selected Schema	49
Figure 6-11	Signal Highlighted on the Opened Schema	49
Figure 6-12	Control of the Toolbar Visibility	50
Figure 6-13	Signal Search Window	51
Figure 6-14	Signal Selection in Displayed Shema Tab	52
Figure 6-15	Signal Details Window	53
Figure 6-16	Signal-Value Display Formats	56
Figure 6-17	Signal-Detail Properties Display	57
Figure 6-18	Monitor Tuning Window for Discrete and Analog Signals	59
Figure 6-19	Logging in to the Monitor	60
Figure 6-20	User Account and Time Displaying when User Log In	61
Figure 6-21	User Account and Time Displaying when User Log Out	61
Figure 7-1	Signals Snapshot Window	62
Figure 7-2	Filtering by the Signal Types and Roles	63

Figure 7-3 Filtering by the Schema and Server.....	63
Figure 7-4 Filtering by the Signal ID and Mask	64
Figure 7-5 Mask Filtering Description	64
Figure 7-6 Filtering by the Signal Tag	65
Figure 7-7 Filtering Result	65
Figure 7-8 Freezing the Dynamic Data	66
Figure 7-9 Choose Columns Context Menu.....	67
Figure 7-10 Two Signals Snapshots that Simultaneously Display Different Signals	68
Figure 8-1 Monitor Archive Window	69
Figure 8-2 Archive Signals Dialog.....	70
Figure 8-3 Filtering by the Signal Types.....	70
Figure 8-4 Filtering by the Server	71
Figure 8-5 Filtering by the Signal ID Mask	71
Figure 8-6 Filtering Result	72
Figure 8-7 Signals Selection.....	73
Figure 8-8 Report Settings Tools	73
Figure 8-9 Calendar Dialog.....	74
Figure 8-10 Request Time Type Dropdown.....	74
Figure 8-11 Monitor Archive Report	76
Figure 8-12 Monitor Warning Message	76
Figure 8-13 Selection of the Report Columns.....	77
Figure 8-14 Copying of the Report Data.....	77
Figure 8-15 Calling of the Signal Detail Window	78
Figure 8-16 Tooltip with Signal Description	78
Figure 8-17 Signal Removing	79
Figure 8-18 Two Archive Monitors Which Simultaneously Display Different Reports	80
Figure 9-1 Monitor Trends Window	81
Figure 9-2 Trend Signals Dialog	82
Figure 9-3 Filtering by the Server	82
Figure 9-4 Filtering by the Signal ID Mask	83
Figure 9-5 Filtering by the Signal Tag	83
Figure 9-6 Signals Selection.....	84
Figure 9-7 Basic Display of Monitor Trends	85
Figure 9-8 Display of the Two Signals in Monitor Trends	86
Figure 9-9 Trends for the Same Signals with Different Intervals	87
Figure 9-10 Time Scrolling Tools	88
Figure 9-11 Selecting the Signal to Edit	89
Figure 9-12 Properties Dialog	89
Figure 9-13 Properties Dialog after Properties Editing.....	91
Figure 9-14 Overlapped Displaying of the Two Signals With Linear Scaling	92
Figure 9-15 Separated Displaying of the Two Signals With Logarithmic Scaling.....	92
Figure 9-16 Displaying the Three Lanes With Period Scaling	93
Figure 9-17 Trend Rulers	94
Figure 9-18 Application of the Select View.....	96
Figure 10-1 Connection Settings Tab.....	98
Figure 10-2 View Settings Tab	99
Figure 10-3 Item Labels Visualization.....	100
Figure 10-4 Other Settings Tab	101
Figure 10-5 Two Monitors Run Simultaneously.....	101
Figure 10-6 Data Sources Window	102
Figure 10-7 Connections Statistics Window	102

Figure 10-8 Log View Window	103
Figure 10-9 Tuning Log View Window	105

Tables

Table 1-1 Version Information.....	7
Table 1-2 Software Version Information	7
Table 1-3 Reference standards	7
Table 1-4 Reference documents	7
Table 4-1 Non-functional and functional items	18
Table 5-1 Archive File Format	28
Table 5-2 Example of the Size of Archive of a Signal.....	29
Table 5-3 Configuration Service Command Line Arguments	30
Table 5-4 Application Data Service Command Line Arguments	33
Table 5-5 Archive Service Command Line Arguments	36
Table 6-1 Monitor Main Screen	43
Table 6-2 Main Menu Bar Functions in Region 1.....	43
Table 6-3 Main Menu Bar Functions in Region 2.....	46
Table 6-4 Signal Detail Window Properties.....	53