

SHIMADZU NEXERA

Clarity Control Module

ENG

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To facilitate the orientation in the **Shimadzu Nexera** manual and **Clarity - Shimadzu Edition** chromatography station, different fonts are used throughout the manual. Meanings of these fonts are:

Open File (italics) describes the commands and names of fields in **Clarity - Shimadzu Edition**, parameters that can be entered into them or a window or dialog name.

WORK1 (capitals) indicates the name of the file and/or directory.

ACTIVE (capital italics) marks the state of the station or its part.

Chromatogram (blue underlined) marks clickable links referring to related chapters.

The bold text is sometimes also used for important parts of the text and the name of the **Clarity** - **Shimadzu Edition** station. Moreover, some sections are written in format other than normal text. These sections are formatted as follows:

Note:	Notifies the reader of relevant information.
Caution:	Warns the user of possibly dangerous or very important information.

Marks the problem statement or trouble question.

Description: Presents more detailed information on the problem, describes its causes, etc.

Solution: Marks the response to the question, presents a procedure how to remove it.

1 Shimadzu Nexera

This manual describes the use of the Shimadzu Nexera with the Clarity - Shimadzu Edition software.



Fig. 1: Shimadzu Nexera

Shimadzu Nexera is controlled using RC.NET driver developed by **Shimadzu** running under the Agilent ICF (Instrument Control Framework) library developed by Agilent, which can be run within the **Clarity - Shimadzu Edition** environment. List of controlled system parts is available in the "Requirements" chapter.

2 Requirements

2.1 Software requirements

Shimadzu Nexera RC.net driver is exclusively available in Clarity - Shimadzu Edition OEM version. This OEM version is only available in selected countries (Europe region) and sold through approved distributors. In terms of Clarity - Shimadzu Edition product numbers, this includes:

- Clarity Shimadzu Edition (p/n C50-28)
- LC Control license (p/n A24)
- LC Shimadzu license (p/n A24-001)
- optionally AS Control License (p/n A26) when the system contains an autosampler
- optionally PDA Extension (p/n A29) when the system contains PDA detector

Caution: LC Shimadzu Control license to use the driver (p/n A24-001) must be purchased for each controlled system **Nexera LC** separately. There is similar license for **Shimadzu Nexis GC** systems.

Shimadzu Nexera requires Microsoft .NET version 3.5 for correct installation and Microsoft .NET version 4.8 or higher for correct operation. Both of the versions are already installed on majority of PCs. Nonetheless you will be notified during the installation if your PC is missing any version of Microsoft .NET - then follow the instructions there.

For complete list of .NET requirements, see the .NET Framework System Requirements on Microsoft web page.

Supported operating systems:

- Windows 10 (64 bit)
- Windows 11

Caution: Before installing **Clarity - Shimadzu Edition**, it is recommended that your **Windows** is updated to the latest version.

2.2 Hardware requirements

- LAN interface installed on PC is required.
- Latest available ROM version of connected modules should be used to ensure maximum compatibility. Minimum ROM versions are listed in the following table:

I	/lodule Name	Minimum ROM version
System Controller	CBM-40, CBM-40 Lite, SCL-40	1.40
Mobile phase monitor	MPM-40	1.03
Pump	LC-40B X3, LC-40B XR, LC-40D, LC-40D X3, LC-40D XR, LC-40D XS	1.04
Autosampler	SIL-40, SIL-40 XR, SIL-40C, SIL- 40C X3, SIL-40C XR, SIL-40C XS	1.05
	PlateChanger	1.05
Column Oven	CTO-40C, CTO-40S	1.00
Column Oven	CTO-30A	3.11
	SPD-40, SPD-40V	1.04
	RID-20A	2.04
	RF-20A, RF-20AXS	2.02
Detector	CDD-10Avp	5.10
	Optional AD Board	-
	SPD-M40	2.00
	SPD-M30A	4.04

For complete list of supported Windows OS, instrument firmware, see Shimadzu webpages.

Note: Besides the **Shimadzu Nexera** series operated through the CBM-40 controller, the driver also offers **Shimadzu iSeries LC Systems** (compact systems) and **Shimadzu Nexera/Prominence LC** (operated through CBM- 20/CBM- 30 controllers), but these systems are not controlled in **Clarity - Shimadzu Edition**.

Note: The CBM-40 controller can be under normal conditions used to control most LC-20/LC-30 components, but the RC.net driver does not support such combinations. When such components are connected to the CBM-40 controller, the communication with the system will fail.

3 Installation procedure

Shimadzu Nexera is part of the **Clarity - Shimadzu Edition** *Typical* installation. To install it, select the *Typical* installation or check the **Shimadzu Nexera** in the *Choose Components* dialog in *Instrument Control Framework (ICF)* during the installation of **Clarity - Shimadzu Edition**.

🔼 Clarity - Shimadzu 9.0.0.27	-Alpha Setup —		×
install.	rity - Shimadzu Edition you want to ant to install and uncheck the components you don't	want to	
Select the type of install:	Typical		~
Or, select the optional components you wish to install:	Aglient LC Vaxcend Focus LC Order JAL3 driver PerkinElmer Flexar V Shimadzu CC2030 V Shimadzu Nexera LC Describion		
Space required: 1.1 GB	Position your mouse over a component to see its description.		
Shimadzu Installer ————	< <u>B</u> ack <u>N</u> ext >	Canc	el

Fig. 2: Typical installation of Clarity - Shimadzu Edition

3.1 Installing Correct Version of ICF

Clarity - Shimadzu Edition expects a specific version of Agilent ICF. Because other programs may also be using Agilent ICF, it is possible they've installed a different version than is supported by **Clarity - Shimadzu Edition**. In that case in the installation you will be prompted to reinstall it in order to install correct version. Going forward with this step is crucial for correct functionality of **Clarity - Shimadzu Edition** and **Shimadzu Nexera**.



Fig. 3: Installing correct version of Agilent ICF

Note: This reinstallation of Agilent ICF may cause that other programs using it may not function properly.

3.2 Network connections

The instrument **Shimadzu Nexera** has to be connected to a site network by LAN. It is recommended to attach the hardware directly to the PC avoiding hubs, switches etc. Always contact your local LAN administrator who can make the appropriate settings.

Caution: **Cross LAN** cable is primarily used for the direct connection of the instrument and the PC. This cable can also be used for the connection of the device to the switch or network socket, but with older switches, the **straight LAN** cable might be necessary.

LAN Settings

PC: LAN card, TCP/IP protocol.

Both PC and **Shimadzu Nexera** should be configured on the same IP Address range.

Firewall

Ensure that the firewall does not block communication from the Shimadzu Nexera.

3.3 Connect Key

To control the **Shimadzu Nexera** system, the communication between the RC.net driver and the controller must be enabled by entering Connect Key specific for the controller serial number. The connect key (text file) will be generated by **Shimadzu** support upon providing the Controller (CBM-40, SCL-40, CBM-40 Lite) serial number (could be found in the controller web interface by typing it's IP Address) and the purchased RC.net Agilent ICF Nexera LC driver license number (provided as a document based on purchase of p/n A24-001 LC Shimadzu Control license).

To enter the Connect Key, open the Microsoft EDGE web browser run in Internet Explorer mode and type in the following address:

http://[IP Address at the LC instrument]/html/connectkey.html

Caution: Different browsers than Microsoft EDGE in Internet Explorer mode will not function in displaying the *Input Connect Key* dialog.

3.3.1 Switching Microsoft Edge to the Internet Explorer mode

In order to switch to the Internet Explorer mode, start the Microsoft Edge and get to the Settings page (through the ... button). Once in settings, type "internet explorer mode" to the search pane:



Fig. 4: Switching Internet Explorer mode on

As a next step use the Add button in the Internet Explorer mode pages section to open *Add a page* dialog to specify the address for which the Internet Explorer mode will be used - use the same http:// [IP Address at the LC instrument]/html/connectkey.html address.

3.4 Clarity - Shimadzu Edition Configuration



Fig. 5: System Configuration

- Start the **Clarity Shimadzu Edition** station by clicking on the A icon on the desktop.
- Open the System Configuration dialog accessible from the Clarity Shimadzu Edition window using the System Configuration... command.
- Press the Add button ① (See 3.4 on pg. 8.) to invoke the Available Control Modules dialog.
- You can specify the searching filter 2 to simplify the finding of the driver.

 Select the Shimadzu Nexera item and press the Add 3 button. The Nexera Series Setup dialog will open.

Nexera Series Setup		-		×
⊕- Shimadzu I-Series LC System ⊕- Shimadzu Nexera Series ⊕- Shimadzu Nexera/Prominence LC	CBM-40 (L22445600119)			
	> <			
	Auto Configure			
	Up Down	Configure	Cle	ar
• This Device Starts the Run in Clarity	Turn OFF Pump on closing instrument	ooninguro		
Clarity Starts This Device	Turn OFF Pump on Shutdown			
Create a real time signal for external fraction collectors	Turn OFF Detector lamp on closing instrume	nt		
Sequence Mode	Turn OFF Detector lamp on Shutdown			
Custom name Use Demo Config	ОК	Cancel	Hel	p

Fig. 6: Nexera Series Setup

 Select the Shimadzu Nexera Series instrument type use Auto Configure button to open Automatic configuration parameters dialog.

Caution: Neither the Shimadzu i-Series LC System nor Shimadzu Nexera/Prominence LC systems are supported. This is a limitation of the Shimadzu Nexera control module in Clarity - Shimadzu Edition.

Automatic configuration parameters	×
AutoConfig CBM40 IP Address:]
OK Cancel	

Fig. 7: Automatic configuration parameters dialog

- Insert the *IP Address* of **Shimadzu Nexera** and confirm the dialog using the *OK* button.
- The other fields in the <u>Nexera Series Setup</u> dialog allow to set up the start synchronization of the <u>Shimadzu Nexera</u> with <u>Clarity</u> - <u>Shimadzu Edition</u> analysis starts and behavior of the HPLC during specific moments, e.g.

when *SHUTDOWN* is invoked or **Clarity - Shimadzu Edition** *Instrument* is closed. The options are described in particular manual topic.

- Click OK button in the lower part of the Nexera Series Setup dialog and the instrument will then appear in System Configuration, including all modules of the instrument (detector, autosampler etc.).
- Change the *Instrument Type* (5) (a) on the desired *Instrument* tab (5) (b) to LC-PDA.
- Drag the **Shimadzu Nexera** item from the *Setup Control Modules* list on the left ④ to the *Instrument* tab on the right ⑥ , or use the → button ⑦ .
- Set the *Ext. Start Dig. Input* (3) on the right bottom side of the *System Configuration* dialog according to the physical configuration and wiring of the Shimadzu Nexera. When the settings of the *Ext. Start Dig. Input* is set to default value with analysis start will be detected by Clarity Shimadzu Edition by receiving data from the Shimadzu Nexera detector configured on this *Instrument*. In case Shimadzu Nexera does not have any detector configured but contains an autosampler it is necessary to set *Ext. Start Dig. Input* to value with to notify Clarity Shimadzu Edition of the moment of injection.

3.5 Installation Qualification of Shimadzu Nexera

Shimadzu Nexera is controlled via Agilent ICF, an external program developed by Agilent, and for that reason it must be validated using their utility. If you have installed Clarity - Shimadzu Edition with Agilent ICF, the IQ is valid only if successful validation of ICF is attached.

The validation of ICF can be performed directly from the IQ Report.

Contion

Caution: When Clarity - Shimadzu Edition expects Agilent ICF is installed then IQ expects the same. If (due to any reason) the Agilent ICF installation is not found within Clarity - Shimadzu Edition, the Installation Qualification Test status is set by default to FAILED. To resolve this, it is necessary to re-install Agilent ICF through Clarity - Shimadzu Edition reinstallation and then perform IQ again.

Date	22.03.2023, 13:28	
Serial number of application	088-061271+38911/00	
User Code	ZJGU8RX96YP7TFFU3	
Version of application	ClarityShimadzu version 9.0.0.27	
Build date of application	03.02.2023, 01:31	
Instruments	All	
Extensions	SST; GPC; PDA; EA; CE; MS; NGA; DHA; GCxGC; MS-TOF	
Controls	GC; LC; AS	
Certification file	D:\ClarityShimadzu\Bin\iq.chk	
Checksum of cert. file	78D81FDEA4727934	
Date of cert. file	06.02.2023, 01:42	
User	maries	
System	Microsoft Windows 11 Professional version 10.0 (Build 22621)	
Acquisition and hardware device	Key Rockey 4ND 088-61271+00/000 id:28EA6A14 Nexis GC-2030 C12255500047	
Core Files, Emb Files Show files list »	oedded Components: Passed	
Files	ges	

Fig. 8: IQ Report with ICF installation present

Press the link *"here"* ①, select the necessary components to qualify in the emerging dialog (particular drivers are qualified as part of the Agilent ICF item) and then use the *Qualify* ② button to generate the report. The form and placement of the generated report is dependent on the options selected in the *Agilent Software Verification Tool* dialog, by default the html report is created and automatically

opened in the default browser. The version of **Shimadzu Nexera** driver can be found in the last table on the report.

💥 Agilent Software Ve	rification Tool B.01.01.013		-		×
Reports to create HTML Report PDF Report KML Report	Report option Show OK files in report		cation action ports (HTML and	PDF only)	Help
Reports folder					
C:\SVReports\				Open	
⊕ 2 Agilent ICF ⊕ 2 Agilent Rap	id Control .NET				
		Refresh	Select All	Quali	fy

Fig. 9: Agilent Software Verification Tool

4 Using the Shimadzu Nexera

There are multiple places for setting the parameters of the **Shimadzu Nexera** in the **Clarity - Shimadzu Edition**:

- the Method Setup Acquisition tab for the parameters of the detectorss
- the Method Setup AS tab for the parameters of the autosampler
- the Method Setup Aux tab for the parameters of event settings
- the Method Setup LC tab for the parameters of the pumps
- the Method Setup PDA tab for the parameters of the PDA detector
- the Method Setup Thermostat tab for the parameters of the column oven

Some of the tabs may not be present based on configured modules assigned to **Clarity - Shimadzu Edition** Instrument - only method parts which have corresponding module in configuration appear.

Caution: Before opening the *Instrument* window with **Shimadzu Nexera** device configured, ensure that there is no other PC connected to HPLC, else a communication error appears.

4.1 Method Setup - Acquisition

lew	Open	. Save	Save as	Report setup	Audit trail	Send method by e-mail	(?) Help		
ct Det	tector		PDA: F	leference	~ 2 e	inabled			
M	SPD	-M40							
ata a	cquisitio	n			-3D (data acquisition settin	gs	¥	-
nd tir	me:		Same as Stop ti	me	Γ ^{Refe}	erence settings ———		*]
				10,00 min	Refe	erence wavelength:	350	nm	
					Refe	erence bandwidth:	20	nm	
ampli	ng:		640 ms / 1,56	3 Hz 🔻		Output reference chan	nel		
me co	onstant:		Standard	▼ 1280 ▼ ms		anced	inci i		
2D da	ta acqui	sition—			Lam	p:	D2	-	
Use	Ch		Data acquisit	ion settings			40	°C	
~	1	254±4n	m (+),Ref	:	× .	Cell temperature: width:			
	2	254±4n	m (+),Ref	-	8		8	✓ nm	
	3	254±4n	m (+),Ref		⇒ ^{UV}	(< 240 nm) cut filter:	Off	-	
	4	254±4n	m (+),Ref	:		elength of light energ ord in data:	y to 290	nm	
	5	254±4n	m (+),Ref	:	\vee				
	6	254±4n	m (+),Ref		~	log output settings —		*	٦
	7		m (+),Ref			Output range:	1,0	▼ AU/V	
	8	254±4n	m (+),Ref		Sec. Ch2	Output range:	1,0	▼ AU/V	
					Ch3	Output range:	1,0	▼ AU/V	
					Ch4	Output range:	1,0	▼ AU/V	
ent Ta	-LI	AS LO		nt Acquisition PDA	Thermost		on PDA Method Calculation	Advantat	_
encia	able /	45 LU	. Medsuremer	nt Acquisition PDA	mermost	at Aux Integratio	on PDA metriod Calculation	Auvanced	

Fig. 10: Method Setup - Acquisition

Note: Press the *F1* key to display the **ShimDriver help** with detailed description of the dialog.

Acquisition tab serves for setting the method parameters of the **Shimadzu Nexera** detectors. Both the parameters for normal and spectral detectors (spectral range etc.) are set here. Contents of the *Acquisition* tab are the same as contents of the *PDA* tab.

4.2 Method Setup - AS

New Oper		ve Save as	Report setup	Audit trail	Send method by e-mail	? Help		
lect Sampler		Sampler		V 🛛	Enabled			
Sampler Inje	tor							
SI	-40C	X3		Dire	ect injection			
 Autosamp 	ler			r Sa	mple plate settings —		- * -	>>>>
Injection set	ings —			0	Specify plate			Pretreatment
Injection vol	ume:		1,0 µL		Specify needle stroke			 Pretreatment
Sampling sp	eed:		5.0 µL/s	r Inj	ection settings		- * -	2
Cooler to		ire:	15 °C		Air gap volume:	0,1 µL		
Rinse settin	15					imization		
Rinse type		External only						
		Refer flow	channels		insing speed:	35 uL/s		
External					inse volume:	500 µL		
Rinse mod	e:	Before and after asp Dip time:0s		-	leasuring line purge vol			
					tail		- * -	
Rinse meth	od:	Rinse port only Time:2,0s		•	Wait for temperature	equilibration before run (sample cooler)		
				w	ait time:	0 min		
Rinse port	iiquid:	R1 *						
	_	LC Measurement			tat Aux Integration	PDA Method Calculation Advanced		

Fig. 11: Method Setup - AS

Note: Press the *F1* key to display the **ShimDriver help** with detailed description of the dialog.

AS tab serves for setting of the program of the autosampler and injector.

4.3 Method Setup - Aux

New	Open	Save	Save as	Report setup	Audit trail		ethod by ail	? Help				
elect Au	x		System (Controller	V 🛛 🖬	nabled						
	CBM-	40lite										
					Shut	down setti	pas					° -)
Extern	al output :	settings –					after shutdow	'n				
	vent 2											
												8
Event T	able AS	LC	Measurement	Acquisition P	DA Thermosta	at Aux	Integration	PDA Method	Calculation	Advan	ced	

Fig. 12: Method Setup - Aux

Note: Press the *F1* key to display the **ShimDriver help** with detailed description of the dialog.

Aux tab commands the usage of the system's Event Outputs, as well as a possible reaction on the Shutdown event received.

4.4 Method Setup - LC

New Open Save	Save as Report setup Audit t		
elect LC	Pump 🗸	Enabled	
B.GE1		B.GE1 – A: LC-40B X3 B: LI	C-40B X3 B.GE ▼
Stop time:	10,00 min	- Gradient	→ Initic program Autopurge
B Conc A Conc 100 0 60 0 90 0 0 0,00	4,00 min 6,00 8,00 10,0	Compressibility settings Mobile phase name A: Mobile phase A Pump B	Compressibilif 0,45 /GPa
Flow:	1,0000 mL/min 0,00 min (Off) 90.0 %	A: Mobile phase A -Gradient start adjustment	Compressibili 0,45 /GPa
B.Conc: Pressure limits Minimum: 0 bai	10,0 % B.Curve	0	ulation Advanced

Fig. 13: Method Setup - LC

Note: Press the *F1* key to display the **ShimDriver help** with detailed description of the dialog.

LC tab provides means for setting the gradient program for the pumps. Looks and functionality of some parts of the dialog rely on presence of particular modules - e.g. when MPM-40 Mobile Phase Monitor is present in the system, it allows to select the particular mobile phase names and their compressibility factors are automatically filled in the *Mobile phase settings* pane of the dialog.

4.5 Method Setup - PDA

	Open.	. Save Save as Report se		dit trail Send method by Help e-mail	
lect PDA		PDA: Spectrum, 190-	800 nm	Enabled	
	SPD	-M40			
				- 3D data acquisition settings	
Data ac End tim		 Same as Stop time 		✓ 3D data acquisition	
chu tim	ie:		min) - <u>800</u> nm
		0		Wavelength range: 190	0800_nm
Samplin		640 ms / 1.563 Hz	T	Step: 1 💌	nm
1.1				Data rate is 446,78 KB/min.	
Time co			▼ ms	Reference settings	* _
- 2D dat		1		Reference wavelength: 350	nm
Use	Ch	Data acquisition settings		Reference bandwidth: 20	nm
~	1	254±4nm (+),Ref	*	Output reference channel	
	2	254±4nm (+),Ref	*	Advanced	
	3	254±4nm (+),Ref 254±4nm (+),Ref	*	Lamp: D2	
	4	254±4nm (+),Ref	*		°C
	6	254±4nm (+),Ref	× ×	Cell temperature: 40	
	7	254±4nm (+),Ref	× ×	Slit width: 8	▼ nm
	8	254±4nm (+),Ref	×	UV (< 240 nm) cut filter: Off	~
		5 <i>1</i> 1	v	Wavelength of light energy to 290 record in data:	nm
				– Analog output settings	×
vent Ta		AS LC Measurement Acquisition	PDA	Thermostat Aux Integration PDA Method Cal	- define a discound

Fig. 14: Method Setup - PDA

Note: Press the *F1* key to display the **ShimDriver help** with detailed description of the dialog.

PDA tab serves for setting the method parameters of the **Shimadzu Nexera** detectors. Both the parameters for normal and spectral detectors (spectral range etc.) are set here. Contents of the *PDA* tab are the same as contents of the *Acquisition* tab.

4.6 Method Setup - Thermostat

_	· ·				12:16:21		_							
New	Open	Save	Save		Report setu	ip A	Cudit trail	Send m	ethod by nail	? Help				
elect The	ermostat			Oven			V 🖉 B	nabled						
1	Colum	n Over	n				A: CT	D-40C						
🗸 Co	lumn Oven	Ą					- Over	n A - Adva	nced					× –
Oven	temperatu	re:		4	40 °C									× –
Temr	perature lim	it/Mavim	um):	1/)5 °C									
		Individianti	unny.		,5 C		1							
Read	ly check:			On Wait tim	e:5min	~								
				Ready ra	ange:1,0°C									
							_							
Event Ta	able AS	LC	Meas	surement	Acquisition	PDA	Thermosta	at Aux	Integratio	n PDA Metho	d Calculation	Advan	nced	
	K Car	col								Le le	ad Method	3 s	end Met	hod

Fig. 15: Method Setup - Thermostat

Note: Press the *F1* key to display the **ShimDriver help** with detailed description of the dialog.

Thermostat tab serves for setting the method parameters for the column oven of the **Shimadzu Nexera** system.

4.7 Device Monitor

The *Device Monitor* window can be opened by the *Device Monitor* command from the *Analysis* menu or using the **Device Monitor** @ icon in the *Instrument* window.

You may use icon for accessing *Device Monitor* from all **Clarity - Shimadzu Edition** windows. This window is for acquiring measured values or control information from instruments so that each instrument status can be monitored.



Fig. 16: Device Monitor

Note: Press the *F1* key with the focus placed inside the monitor pane to display the **ShimDriver help** with detailed description of the window.

- *Note:* Tabs on right side of the *Device Monitor* allowing to set collection of diagnostic information are displayed only when **Clarity Shimadzu Edition** is started under Windows account with administrator privileges. For other Windows accounts fewer tabs on the right side of the pane may be displayed.
- *Note:* The *Shutdown* command behavior depends on the state of the *Turn OFF Pump* on *Shutdown* and *Turn OFF Detector lamp on Shutdown* checkboxes in the <u>Nexera Series Setup</u> dialog.
- *Note:* Some errors may not be cleared using *Device Monitor* and have to be cleared via manual commands using display of the HPLC.

The device monitor pane compartments may hold specific behavior. Regarding the autosampler, **Shimadzu Nexera** autosamplers do not support graphical selection of the vial in the *Sequence* window, the small arrow used for graphical selection of a vial is non-functional. The vial positions must be entered in the form of "plate number": "vial number", e.g. "1:5" notation means fifth vial on the first plate. In case the platechanger is configured, the vial plates present in the changer are numbered 1-14, the two plates in the sampler are 101 and 102.

4.8 Nexera Series Setup

The dialog allows to set up the start synchronization of the **Shimadzu Nexera** with **Clarity - Shimadzu Edition** analysis starts and behavior of the HPLC during specific moments, e.g. when *SHUTDOWN* is invoked or **Clarity - Shimadzu Edition** *Instrument* is closed. Moreover, the dialog provides access to the dialogs allowing to set the configuration parameters of particular configured **Shimadzu Nexera** modules.

Vexera Series Setup		-		×
⊕ Shimadzu i-Series LC System ⊕ Shimadzu Nexera Series ⊕ Shimadzu Nexera/Prominence LC	CBM-40 (L22445600119)			
	C			
	Auto Configure			
	Up Down	Configure	Cle	ar
 This Device Starts the Run in Clarity 	Turn OFF Pump on closing instrument			
Clarity Starts This Device	 Turn OFF Pump on Shutdown 			
Create a real time signal for external fraction collectors	Turn OFF Detector lamp on closing instrum	ent		
Sequence Mode	Turn OFF Detector lamp on Shutdown			
Custom name Use Demo Config	ОК	Cancel	He	lp

Fig. 17: Nexera Series Setup

Left pane of the dialog shows the possible HPLC systems to configure. Only the *Shimadzu Nexera Series* item is configurable, other options are not supported in **Clarity - Shimadzu Edition** driver. Right pane displays the type and serial number of the system controlled once it is detected. To detect the system, select the *Shimadzu Nexera Series* in the left pane and press the *Auto Configure* button. The *Automatic configuration parameters* dialog appears:

Automatic configuration parameters	×
AutoConfig CBM40 IP Address:	
OK Cancel	

Fig. 18: Automatic configuration parameters dialog

The dialog allows to set the *IP Address*, upon pressing the *OK* button the connection to the set *IP Address* is established and connected **Shimadzu Nexera** is detected based on the information the supported controller has on the system. The detected system components are then added to the right side pane of the *Nexera Series Setup* dialog as the *Automatic configuration parameters* dialog is closed.

This Device Starts the Run in Clarity

This radiobutton should be selected when the **Shimadzu Nexera** will be the source of the start signal, e.g when the system contains controlled autosampler or when an uncontrolled autosampler provides start input to **Shimadzu Nexera** over digital input. The setting forces the control module to properly handle **Clarity - Shimadzu Edition** response to such signal. Most configurations should use this option.

Clarity Starts This Device

This radiobutton should be selected when the **Shimadzu Nexera** will not know about the start signal earlier than **Clarity - Shimadzu Edition**, e.g when the there is a controlled autosampler not belonging to the **Shimadzu Nexera** system which is as well <u>not connected</u> to the **Shimadzu Nexera** using digital input. The setting lets the control module to properly start the **Shimadzu Nexera** when start signal is passed to it from **Clarity - Shimadzu Edition**.

Create a real time signal for external fraction collectors

This option turns on an additional real time signal during the acquisition run which can be used for fraction collectors as an immediate data signal to react to. Most other signals may have delays in displaying data in the matter of seconds.

Sequence Mode

If checked, it enables to use high throughput operations of the autosampler. Depending on the type of the sampler and functions it supports, this either means using "Full Sequence Download" functionality (working with optimized sequences of up to 60 samples) or enabling to use the Enable Optimization functionality on Method Setup - AS tab.

Turn OFF Pump on closing instrument

Decides on the behavior of the **Shimadzu Nexera** pumps when closing **Clarity -Shimadzu Edition** *Instrument*. When not checked, the state of the pump will not change on such action.

Turn OFF Pump on Shutdown

Decides on the behavior of the **Shimadzu Nexera** pumps when *SHUTDOWN* event is invoked (either by user action or because of error). When not checked, the state of the pump will not change on such event.

Turn OFF Detector lamp on closing instrument

Decides on the behavior of the **Shimadzu Nexera** detector lamps when closing **Clarity - Shimadzu Edition** *Instrument.* When not checked, the state of the detector lamp will not change on such action.

Turn OFF Detector lamp on Shutdown

Decides on the behavior of the **Shimadzu Nexera** detector lamps when *SHUTDOWN* event is invoked (either by user action or because of error). When not checked, the state of the detector lamp will not change on such event.

Custom name...

Opens a *Custom Name* dialog that allows to set a custom name of the **Shimadzu Nexera** HPLC. This name is later used in various places in **Clarity - Shimadzu Edition**.

Use Demo Config

Button only present in DEMO mode. Allows to load a pre-prepared DEMO configuration from the **Shimadzu Nexera** driver to work in DEMO mode on.

Note: Most of the parameters stored in the configuration of **Shimadzu Nexera** must be read out from the live instrument. Without using the *Use Demo Config* button it is not possible to see the methods of the HPLC in the *Method Setup* dialog. It is not possible to change the pre-loaded configuration.

More detailed configuration parameters can be opened by using *Configure* button in *Nexera Series Setup* dialog while the controller in the right pane of the dialog is highlighted. In the emerging *Configure CBM-40* dialog the discovered modules are organized on tabs, some of their parameters are visible and others can be changed. For more detailed description of individual settings and parameters press *F1* or *Help* button to open **ShimDriver help** for **Shimadzu Nexera** modules as prepared by **Shimadzu**.

onfigure CBM-40			
IP Address:	10.5.7.110	Pump Autosampler Column Oven PDA Detector System Controller	
Pressure unit:	bar 👻	Pump A 👻	
Instrument Configuration –		Model: LC-40B X3 Unit ID:	
Pump		Serial number: L22445600119 ROM version: 1.03	
Pump A	LC-40B X3	Auto pulsation check: On	
Pump B	LC-40B X3	External valve External valve	
Autosampler	SIL-40C X3	Model: Not installed Model: Not installed	
Column Oven		Serial number: Serial number:	
Oven A	CTO-40C	Mobile phase selection A: None B: None C: None D: None	
PDA Detector	SPD-M40	Mobile phase monitor	
System Controller	r CBM-40lite	Mobile phase settings: Auto Fixed	
		Model: Not installed ROM version:	
		Serial number: Detail	
		System check settings	
Help		OK	Car

Fig. 19: Configure CBM-40 dialog

5 Troubleshooting

When the solution for some problem cannot be discovered easily, the recording of communication between **Clarity - Shimadzu Edition** and **Shimadzu Nexera** control module can significantly help the **DataApex** support to discover the cause of the problem. The created *.LOG files will greatly help in diagnosis of unrecognized errors and problems.

The recording is enabled by default and creates logs in Cfg section of the installation directory (C:\CLARITYSHIMADZU\CFG\DEBUG_LOGS\PGMLOG\ by default). The communication logs are quite verbose and older ones are removed, so in order to diagnose a problem, the log collected during that problem happening should be copied out soon after.

In case you cannot establish communication with Agilent instruments, please review the following issues:

Check the network connection using the Ping command

The problem in communication between **Clarity - Shimadzu Edition** and **Shimadzu Nexera** may be caused by wrong network configuration, firewall preventing the connection, etc. Run the command line in Windows (for example by pressing the **Windows key** together with the **R** key, in the displayed *Run* window type *cmd* and press *Enter*).

In the command line type ping <ip-address-of-instrument> and press *Enter*. The *IP Address* is the same you entered during the configuration.

5.1 Specific Problems

Clarity - Shimadzu Edition can't be run and it displays "Agilent ICF is not installed correctly." message.

- *Cause:* The cause of the problem is that the Agilent ICF has a different version than expected by **Clarity Shimadzu Edition**. It can typically happen when other software also using Agilent ICF decides to reinstall it. Thus next time Clarity Shimadzu Edition expects different version than is installed.
- Solution: Solution is to reinstall Agilent ICF during **Clarity Shimadzu Edition** installation. Follow steps described in the chapter **"Installation procedure"** on pg. **4**.

Print of *Injection Control* is not functional.

- Cause: Agilent ICF is incompatible with some Clarity Shimadzu Edition printing procedures.
- Solution: Method parameters of autosampler control are printed together with another GC control method parameters using *Instrument Control* item within *Method* section in *Report Setup* dialog.

"Automatic configuration failed." during configuration process.

- Cause: For some reason, the automatic detection of the system could not be finished. The most typical reasons are caused by wrong IP address, system used by another software, not entered or wrong Connect Key or connected/configured module not supported by the RC.Net Agilent ICF Nexera LC driver.
- Solution: Solution to the situation depends on the particular cause of the problem. The exact cause can be found out in the log in C:\ProgramData\Shimadzu\LCDriver\logs\log.txt file. Eventual solutions contain: Wrong IP Address correcting the IP Address or the network settings.

System used by other software - stop the different software connected to the **Shimadzu Nexera**. The controller restart may be needed after any amendments or disconnection from different software.

Not entered or wrong Connect key - for procedure see the chapter "Connect Key" on pg. 7.

<u>Module not supported</u> - supported modules are listed in the chapter **"Requirements"** on pg. **2**. Contact Shimadzu with a request to add more controls to the driver in case your module is not supported.