

CSG-OS External Control Configuration Guide

Covering software versions V2.02 and V2.03



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1. Preparation

Prior to initiating external controls from any source, it is essential that the CSG package is fully prepared and able to accept external commands.

It is essential that the commissioning procedure presented in the relevant instruction manual for the CSG package has been adhered to, including all mechanical & electrical installations, commissioning sequence, first start sequence and tuning sequence.

Some external controls may be initiated by systems that are in a location that is not able to safely monitor the commissioning of the connected pipework. As such, it is essential that all of associated downstream pipework and steam systems have been fully checked and commissioned as per any local regulatory requirements.

Additionally, correctly tuning the PID controls for water level and steam pressure under real conditions and under realistic loads is considered essential as these controls are not accessible with external controls

1.1 Preparation check list:

- Mechanical installation of CSG package
- Electrical installation of the CSG package
- Commissioning sequence through CSG-OS (may be completed by manufacturing centre as part of FAT)
- First start sequence
- Clean steam system fully tested
- CSG package PID functions tuned with representative system loads

1.2 Initialisation checklist:

Prior to beginning the initialisation process (Section 9), it is important to ensure that all external control connections to the CSG package has been installed to any local regulatory standards and are ready to transmit/control (Section 3).

- Preparation checklist complete
- External connections to CSG package installed
- Communications module configured (if fitted)
- Communications module tested (if fitted)
- Watchdog Return system enabled (if required)

2. Software version control

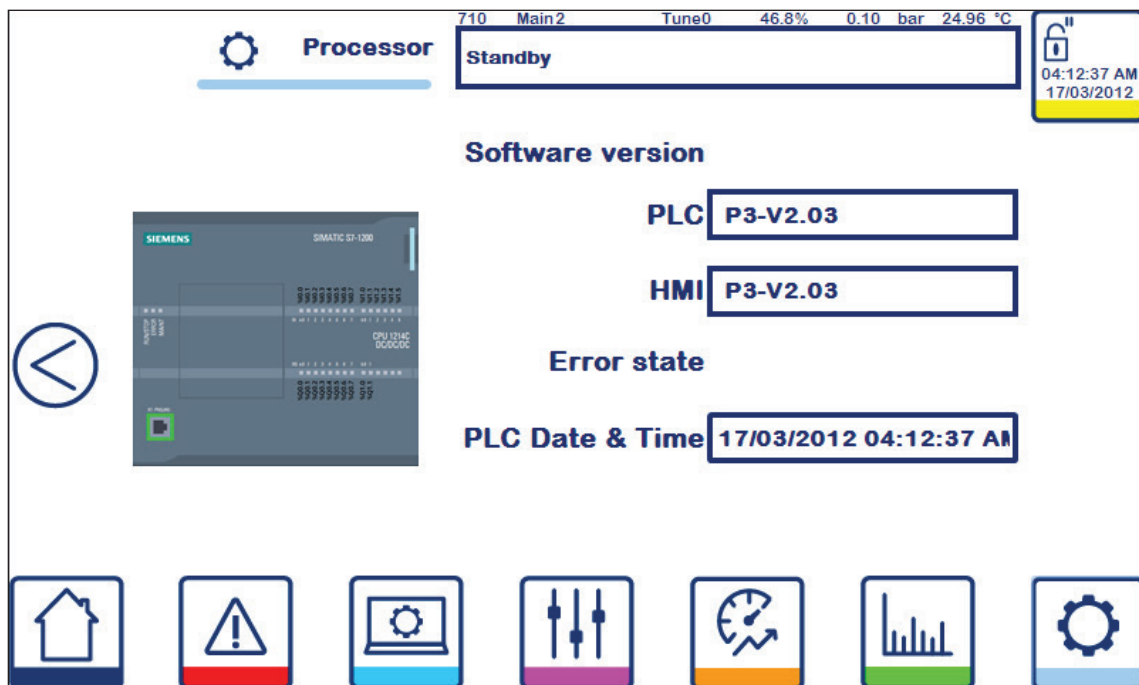
CSG-OS software revisions are handled using the following nomenclature. When checking for compatibility with this configuration guide please ensure that the correct software has been installed.

P3-V2.03

Platform	Version Number	Build Number
P1 = ABB P2 = Allen Bradley P3 = Siemens Package specific and can be read from the label.	Only altered when fundamental changes occur so that previous version are no longer compatible. e.g. wiring or mechanical changes Must be the same as the original software version from the supply site.	Revision of the software's features and processes valid across all the version numbers. Sequential from the very first CSG. Does not reset when version numbers are increased.

If the software version is not known prior to configuring the remote communications, this can be verified from the system settings screen.

From the System menu, select the PLC status page.



A minimum of login level 2 (customer engineer) is required.

3. External connections

Any electrical connections external to the CSG package must be installed in line with any local regulatory standards.

3.1. Remote termination

Remote monitoring and remote control utilise volt-free relay contacts for on/off signals, a 4-20mA for an analogue output and an extension of the emergency stop circuit. The specific terminals used for these connections are listed in **Appendix D**.



The controls available to remote control and monitoring are listed below:

	Control	Monitoring
Run	X	X
Stop	X	
Emergency stop	X	X
Clean Steam pressure		X

3.1.1. Run Status Relay

The Run Status Relay is a no-volt contact relay that is triggered by the CSG-OS when running either start-up sequences, shutdown sequence or run mode.

During standby mode, commissioning mode, remote control selection mode, emergency stop and service sequence, the Run Status Relay is de-energised.

3.1.2. Alarm Status Relay

The Alarm Status Relay is a no-volt contact relay that is triggered when the emergency stop status is triggered. The relay will not de-energise until the emergency stop has been reset. Please refer to the instruction manual for the appropriate CSG package for clearing and resetting the emergency stop status.

3.1.3. Clean Steam Pressure

The clean steam pressure is retransmitted by the CSG-OS over a self-powered 4-20mA source. The scaling for the retransmission is the same used for PA21 Clean Steam Pressure analogue input. Please refer to the appropriate instruction manual for the CSG package for the configuration of the 4-20mA scaling of PA21.

3.1.4. Remote run request

The Remote Run Request relay requires a 24V dc signal to be provided to the terminals (see **Appendix D**). The request will only be accepted by the CSG-OS when the following conditions have been met:

Condition	Required status
External control configuration	Remote Control
CSG-OS run status	Standby mode (STEP_MAIN = 2)
Local override	Disabled
Stop Request Relay	De-energised

If the above conditions are not met, but the Run Request relay is energised, the command will not be accepted by the CSG-OS. The relay must be de-energised until the above conditions are met before the command will be accepted.

3.1.5. Remote stop request

The Remote Stop Request relay requires a 24V dc signal to be provided to the terminals (see **Appendix D**). The request will only be accepted by the CSG-OS when the following conditions have been met:

Condition	Required status
External control configuration	Remote Control
CSG-OS run status	Standby mode (STEP_MAIN = 2)
Local override	Disabled

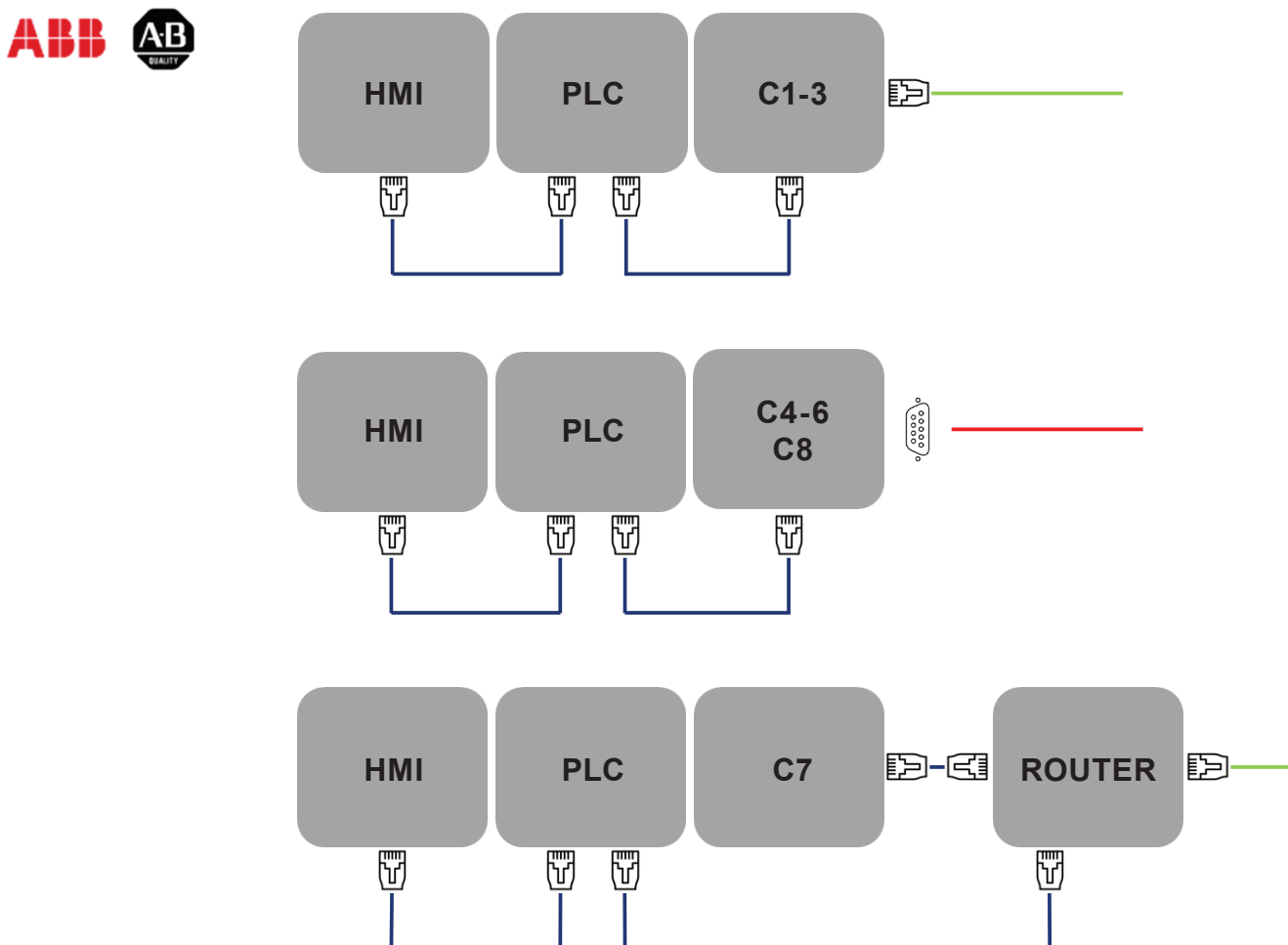
If the above conditions are not met, but the Stop Request relay is energised, the command will not be accepted by the CSG-OS. The relay must be de-energised until the above conditions are met before the command will be accepted.

3.2. Network layout

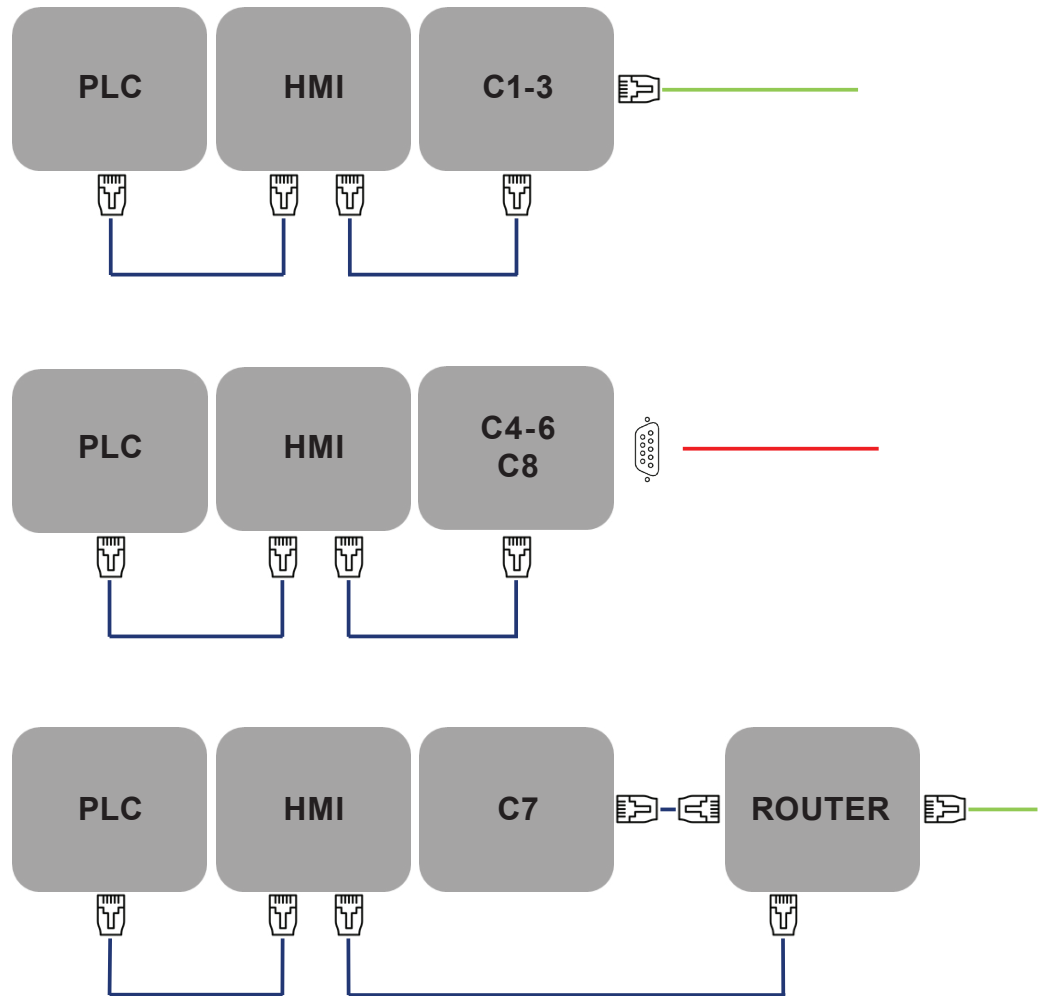
The internal network layout of the CSG-OS is dependent upon the control platform and the communications protocol selected. Externally, the connection is always routed through the Remote Connection device as indicated below.

The internal IP addresses of the CSG-OS cannot be changed regardless of control platform. Only the external communications addresses are changed to meet the customer's requirements.

P1 .ABB and P2.Allen Bradley



SIEMENS



In all instances where an external connection is selected (C1-C8), the external connection device can be configured using the instructions in **Annex C**.

As stated in section 1, always follow the prescribed procedure for initialising remote communications on any CSG-OS.

3.2.1. Communications run request

The Communications Run Request is a bit included in the Command WORD (see **Appendix B**). The request will only be accepted by the CSG-OS when the following conditions have been met:

Condition	Required status
External control configuration	Comms Control
CSG-OS run status	Standby mode (STEP_MAIN = 2)
Local override	Disabled
Communications Watchdog	Healthy
Stop Request	De-energised

If the above conditions are not met, but the Run Request bit remains energised, the command will not be accepted by the CSG-OS. The bit must be de-energised until the above conditions are met before the command will be accepted.

3.2.2. Communications stop request

The Communications Stop Request is a bit included in the Command WORD (see **Appendix B**). The request will only be accepted by the CSG-OS when the following conditions have been met:

Condition	Required status
External control configuration	Comms Control
CSG-OS run status	Standby mode (STEP_MAIN = 2)
Local override	Disabled
Communications Watchdog	Healthy

If the above conditions are not met, but the Stop Request bit remains energised, the command will not be accepted by the CSG-OS. The bit must be de-energised until the above conditions are met before the command will be accepted.

3.2.3. Clean steam pressure set point

The clean steam pressure set point request is a UInt with the value multiplied by value stated in **Appendix B**. The request will only be accepted by the CSG-OS when the following conditions have been met:

Condition	Required status
External control configuration	Comms Control
Local override	Disabled
Communications Watchdog	Healthy

If the above conditions are not met, the set point will not be accepted by the CSG-OS.

Additionally, if the set point is outside the allowable limits for the CSG package, the Remote Set point Limit Alarm will be triggered. This is an optional emergency stop and can be disabled in the Alarms Settings screen (220).

3.3. Emergency stop extension

The emergency stop circuit can be extended to a remote station. The emergency stop circuit includes all safety related control devices and will be broken by the remote station in exactly the same way.

Whilst the emergency stop extension is being fitted to the CSG package, the emergency stop circuit will be broken. The CSG-OS will maintain the emergency stop status until the emergency stop circuit is completed and the reset button has been pressed.

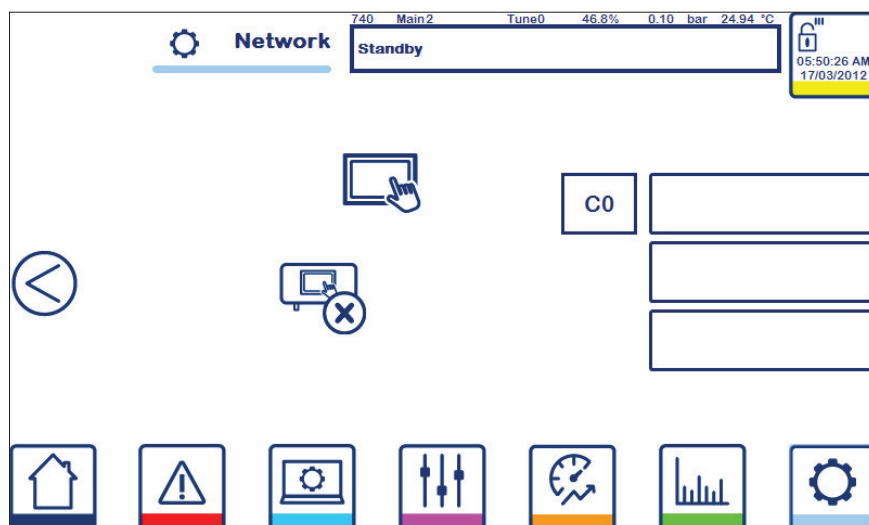
Once installed, the emergency stop extension is always active and always monitored. Disabling remote control or enabling local override will not disable the emergency stop extension.

The emergency stop reset button cannot be extended and must remain in the control panel facia.

4. Local override

If remote control has been initialised and selected by the customer, normal localised control is disabled for all users. However, Local Override control is available to Login level 2 (Customer Engineer) or above. Local override will always be given priority over remote control.

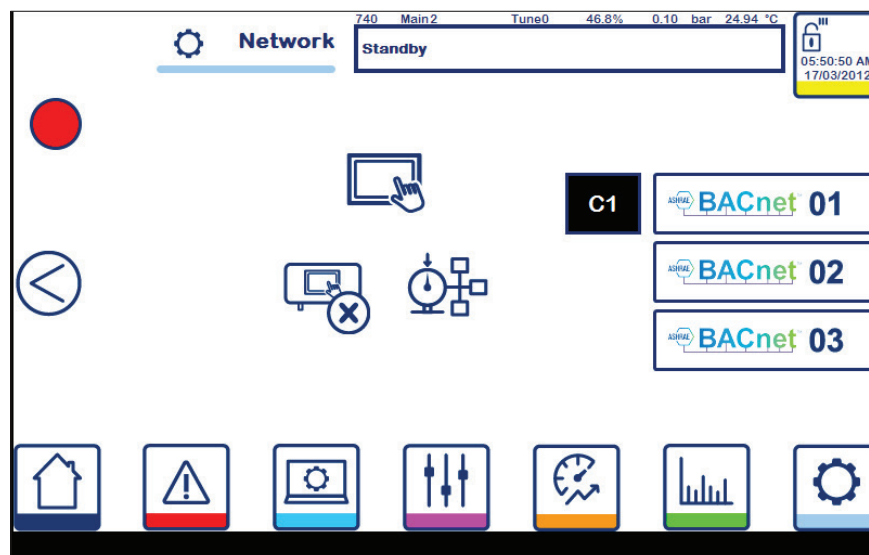
The option to enable local override is only visible when remote controls have been initialised. Please follow the below guide.



Remote start/stop local override



Remote set point local override



Once selected, localised controls can be used as normal and external controls for that function will be blocked. Once local override has been disabled, any external commands will have to re-submit their requests through their respective inputs and will be subject to their respective conditions.

5. Step sequence

The process variable Run Status (see **Appendix B**) describes the internal sequencing of the CSG-OS to allow remote users to understand the status of the CSG package. Run Status is a variable output only and cannot be modified by any external connection. See External Connections (Section 3) for commands to initiate a change in the run status of the CSG-OS.

The specific sequences are described in the instruction manual for the specific CSG package, however these are summarised in **Appendix A**.

Once an emergency stop alarm or optional emergency stop trigger has been energised, the CSG-OS will move to a run status of 799 and will remain there. If the alarm or trigger has been cleared (by manual intervention or by an automatic process), the run status will remain at Emergency Stop (799) until the reset button is pressed on the control panel.

During either the Cold Start sequence or the Restart sequence, the CSG-OS will safely pressurise the CSG package to the desired clean steam pressure. However, the CSG-OS will only be able to operate at full capacity once the run status reaches Run mode (3000). If any equipment or processes are sequenced to run after the CSG package is fully operational, ensure that Run status reads 3000 before starting.

6. Component identification

The component identification codes used in **Appendix B** are described in the Component Map (**section 9**) of the relevant instruction manual for the CSG package.

7. Default connection settings

Default settings for each communications option is listed below.

C1 and C2	IP address	192.168.1.5
	subnet	255.255.255.0
	gateway	0.0.0.0
	BACnet and Profinet Device name	CSG-OS
	Device no.	1
C3 and C7	IP address	DCHP Client
	Hostname	CSG-OS
	MAC address	*
	BACnet Device name	CSG-OS
	Device no.	1
C4-6 and C8	Baud rate	19200
	Device number	1
	Parity	None
	Stop bit	1
	BACnet device name	CSG-OS

8. Communications watchdog

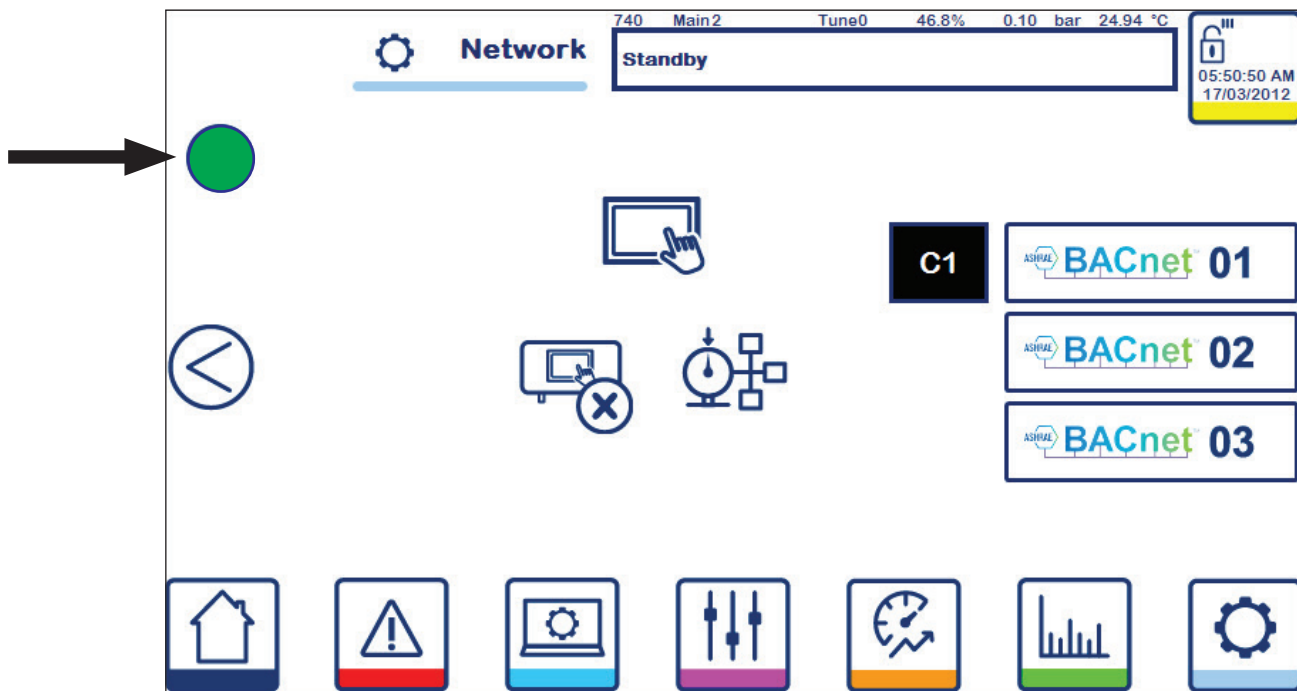
To ensure that correct control is being maintained by the external communications control, a watchdog system is employed.

Whilst the watchdog system is able to verify a valid connection, external communications controls are accepted by the CSG-OS (see section 3.2). If the watchdog system is not able to establish a valid connection, the Control Communication Failure Alarm will be triggered. This is an optional emergency stop and can be disabled in the Alarms Settings screen (220).

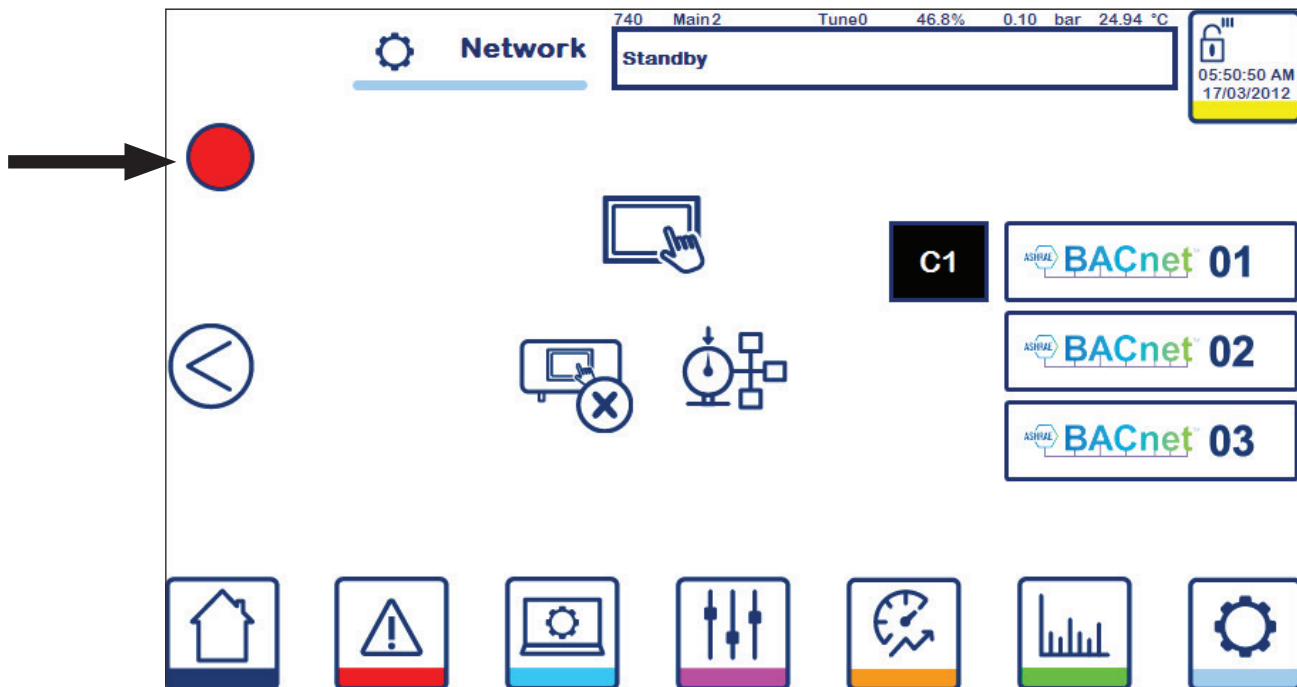
The watchdog system transmits a *UInt* value from the Watchdog Out parameter (See **Appendix B**). When this value is returned via the Watchdog Return parameter (See **Appendix B**), the watchdog system will validate the connection between the CSG-OS and the external communications control.

If the Watchdog Return value does not match the Watchdog Out value, the Control Communication Failure Alarm will be triggered.

The Watchdog Out parameter will periodically change to continually monitor the connection. The external communications control has 5 seconds to return the new value. If the new Out value is not returned, the watchdog system will trigger the Control Communication Failure Alarm.



Watchdog connection verified



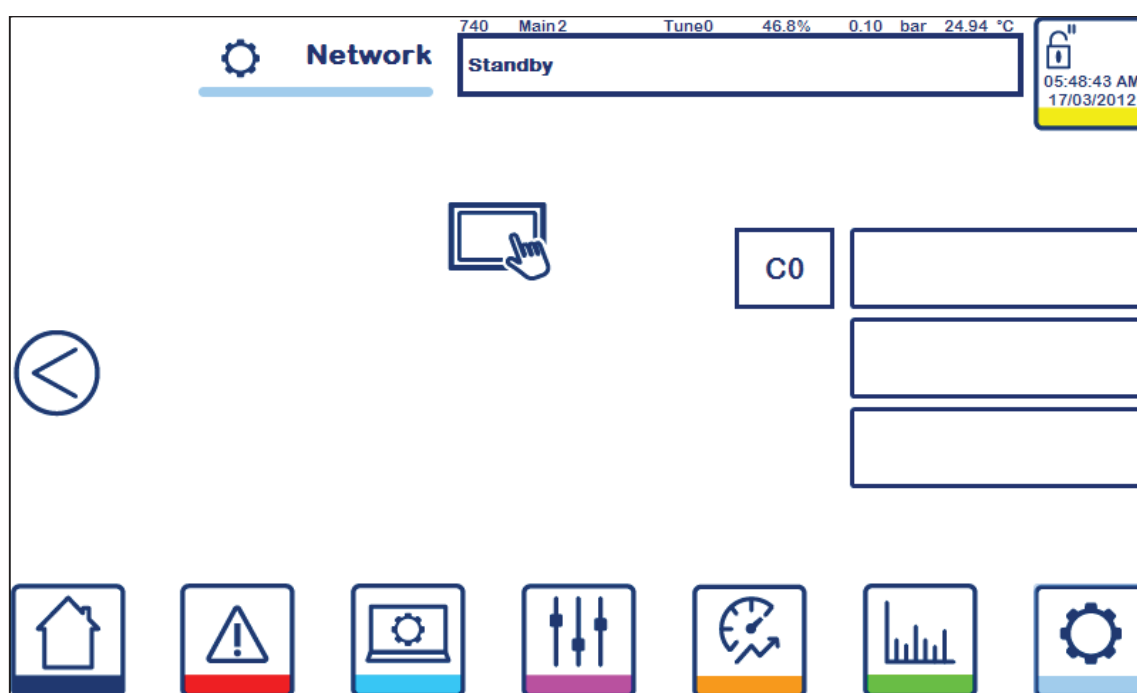
Watchdog connection failure

9. External control initialisation

Note: External connections that only monitor the CSG package do not require External Control Initialisation. Once the correct connections have been made and the communications module has been configured (if fitted), the CSG-OS will transmit data for monitoring purposes.

Once all the stages have been completed from Section 1, the CSG-OS is ready for initialisation of external controls. This must be done by a Spirax Sarco trained commissioning engineer and will require a level 3 access code.

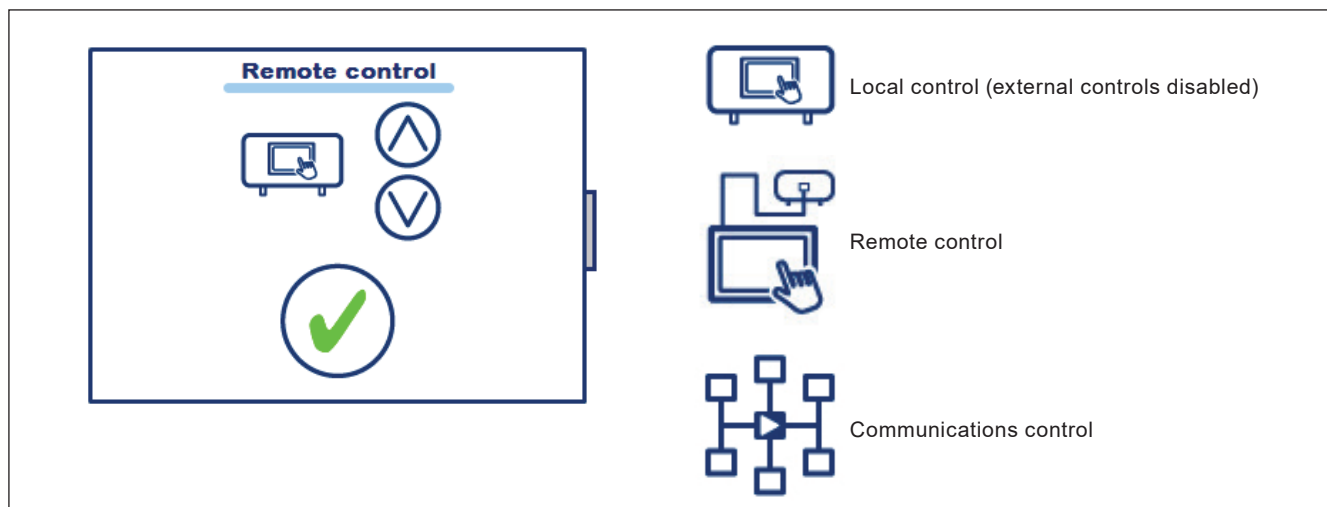
Navigate to the Network screen (740):



Select the Control configuration button:



Use the arrows to select the external control method.



If communications control is selected but the external watchdog return has not been prepared, the CSG-OS will immediately trigger the Control Communication Failure Alarm. This is an optional emergency stop and can be disabled in the Alarms Settings screen (220).

Appendix A

Run status reference number:

Run Status	Status
1	Commissioning mode
2	Standby mode
3	Remote control selection mode
100	Integrity test sequence
300	Cold start sequence
500	Restart sequence
700	Shut-down sequence
799	Emergency stop
800	Service sequence
3000	Run mode

Appendix B - Communications tables:

Output

Register	Designation	type	Comment	Scale
1		Uint	PA01 Water in pressure (bar g/psi g)	x100
2		Uint	PA21 Clean steam pressure (bar g/psi g)	x100
3		Uint	TA01 Feedwater temp (°C/°F)	x100
4		Uint	TA21 Clean steam temp (°C/°F)	x100
5		Uint	FA01 Feedwater flow rate (L/min / GPM)	x10
6		Uint	CA11 Conductivity (uS) (%)	x100
7		Uint	LA21 Water level	x100
8		Uint	VB01 Feedwater control valve CV	x100
9		Uint	VA01 Feedwater control valve feedback	x100
10		Uint	VB31 Supply steam control valve CV	x100
11		Uint	VA31 Supply steam control valve feedback	x100
12		Uint	Primary PID SP (bar g/psi g)	x100
13		Uint	Secondary PID SP (%)	x100
14		Uint	TDS SP (µS)	x100
15		Uint	N/A	x100
16		Uint	N/A	x100
17		Uint	Run time since Factory Reset (hrs)	x1
18		Uint	Diagnostic Word	
	.0	Bool	Primary band low alert	
	.1	Bool	Primary band high alert	
	.2	Bool	Primary control capacity alert	
	.3	Bool	Secondary band low alert	
	.4	Bool	Secondary band high alert	
	.5	Bool	Secondary control capacity alert	
	.6	Bool	Timer enable	
	.7	Bool	Communications watchdog failure	
	.8	Bool	spare	
	.9	Bool	spare	
	.10	Bool	spare	
	.11	Bool	spare	
	.12	Bool	spare	
	.13	Bool	spare	
	.14	Bool	spare	
	.15	Bool	spare	
19		Uint	Alarm 1 word	
	.0	Bool	Alarm 1-1 Heat exchanger scaling alarm	
	.1	Bool	Alarm 1-2 Supply steam leaking through to clean side alarm	
	.2	Bool	Alarm 1-3 Cold leak test alarm	
	.3	Bool	Alarm 1-4 Temp or press alarm in service sequence	
	.4	Bool	Alarm 1-5 Water conductivity analogue input alarm circuit open	
	.5	Bool	Alarm 1-6 Water conductivity analogue input alarm short circuit	
	.6	Bool	Alarm 1-7 Condensate temperature hot	
	.7	Bool	Alarm 1-8 Control valve failure	
	.8	Bool	Alarm 1-9 Feedwater flow rate analogue input alarm circuit open	
	.9	Bool	Alarm 1-10 Feedwater flow rate temperature analogue input alarm short circuit	
	.10	Bool	Alarm 1-11 Feedwater pressurised	
	.11	Bool	Alarm 1-12 Feedwater temperature hot	
	.12	Bool	Alarm 1-13 Water level analogue input alarm circuit open	
	.13	Bool	Alarm 1-14 Water level analogue input alarm short circuit	
	.14	Bool	Alarm 1-15 Major instrument failure	
	.15	Bool	Alarm 1-16 Water in pressure analogue input alarm circuit open	

Register	Designation	type	Comment	Scale
20		Uint	Alarm 2 word	
	.0	Bool	Alarm 2-1 Water in pressure analogue input alarm short circuit	
	.1	Bool	Alarm 2-2 Clean steam pressure analogue input alarm circuit open	
	.2	Bool	Alarm 2-3 Clean steam pressure analogue input alarm short circuit	
	.3	Bool	Alarm 2-4 Supply steam in pressure analogue input alarm circuit open	
	.4	Bool	Alarm 2-5 Supply steam in pressure analogue input alarm short circuit	
	.5	Bool	Alarm 2-6 Primary band HIGH alarm	
	.6	Bool	Alarm 2-7 Primary band LOW alarm	
	.7	Bool	Alarm 2-8 Primary control capacity alarm	
	.8	Bool	Alarm 2-9 Primary side pressurised	
	.9	Bool	Alarm 2-10 Primary pressure low alarm	
	.10	Bool	Alarm 2-11 Primary side temperature hot	
	.11	Bool	Alarm 2-12 Secondary band High alarm	
	.12	Bool	Alarm 2-13 Secondary band low alarm	
	.13	Bool	Alarm 2-14 Secondary control capacity alarm	
	.14	Bool	Alarm 2-15 Secondary side boiler water level low	
	.15	Bool	Alarm 2-16 Secondary side pressurised	
21		Uint	Alarm 3 word	
	.0	Bool	Alarm 3-1 Clean steam temperature hot	
	.1	Bool	Alarm 3-2 Feedwater temperature analogue input alarm circuit open	
	.2	Bool	Alarm 3-3 Feedwater temperature analogue input alarm short circuit	
	.3	Bool	Alarm 3-4 Panel temperature analogueue input alarm circuit open	
	.4	Bool	Alarm 3-5 Panel temperature analogueue input alarm short circuit	
	.5	Bool	Alarm 3-6 Panel temperature limit alarm	
	.6	Bool	Alarm 3-7 Water in temperature analogue input alarm circuit open	
	.7	Bool	Alarm 3-8 Water in temperature analogue input alarm short circuit	
	.8	Bool	Alarm 3-9 Clean steam temperature analogue input alarm circuit open	
	.9	Bool	Alarm 3-10 Clean steam temperature analogue input alarm short circuit	
	.10	Bool	Alarm 3-11 Supply steam temperature analogue input alarm circuit open	
	.11	Bool	Alarm 3-12 Supply steam temperature analogue input alarm short circuit	
	.12	Bool	Alarm 3-13 Supply waste temperature analogue input alarm circuit open	
	.13	Bool	Alarm 3-14 Supply waste temperature analogue input alarm short circuit	
	.14	Bool	Alarm 3-15 Condensate out temperature analogue input alarm circuit open	
	.15	Bool	Alarm 3-16 Condensate out temperature analogue input alarm short circuit	

Register	Designation	type	Comment	Scale
22		Uint	Alarm 4 word	
	.0	Bool	Alarm 4-1 Drain temperature analogueue input alarm circuit open	
	.1	Bool	Alarm 4-2 Drain temperature analogueue input alarm short circuit	
	.2	Bool	Alarm 4-3 TDS failure	
	.3	Bool	Alarm 4-4 TDS hysteresis fault	
	.4	Bool	Alarm 4-5 Integrity test fill failure	
	.5	Bool	Alarm 4-6 Trap failure close	
	.6	Bool	Alarm 4-7 Trap failure open	
	.7	Bool	Alarm 4-8 Water level control valve feedback analogue input alarm circuit open	
	.8	Bool	Alarm 4-9 Water level control valve feedback analogue input alarm short circuit	
	.9	Bool	Alarm 4-10 Supply steam in control valve feedback analogue input alarm circuit open	
	.10	Bool	Alarm 4-11 Supply steam in control valve feedback analogue input alarm short circuit	
	.11	Bool	Alarm 4-12 Feedwater control feedback error	
	.12	Bool	Alarm 4-13 Steam in control feedback error	
	.13	Bool	Alarm 4-14 Waste steam temperature hot	
	.14	Bool	Alarm 4-15 Water pump failure	
	.15	Bool	Alarm 4-16 Water in temperature hot	
23		Uint	Alarm 5 word	
	.0	Bool	Alarm 5-1 Water control valve failure	
	.1	Bool	Alarm 5-2 Secondary high pressure limit alarm	
	.2	Bool	Alarm 5-3 Initialisation	
	.3	Bool	Alarm 5-4 Water level high	
	.4	Bool	Alarm 5-5 Water level failure	
	.5	Bool	Alarm 5-6 Air supply pressure fail	
	.6	Bool	Alarm 5-7 Plant isolation valve fail open	
	.7	Bool	Alarm 5-8 Plant isolation valve fail closed	
	.8	Bool	Alarm 5-9 Plant isolation valve fail stuck	
	.9	Bool	Alarm 5-10 Plant isolation valve fail opening speed	
	.10	Bool	Alarm 5-11 Outlet isolation valve fail open	
	.11	Bool	Alarm 5-12 Outlet isolation valve fail closed	
	.12	Bool	Alarm 5-13 Outlet isolation valve fail stuck	
	.13	Bool	Alarm 5-14 Outlet isolation valve fail opening speed	
	.14	Bool	Alarm 5-15 Customer water supply failure	
	.15	Bool	Alarm 5-16 Bottom drain valve fail open	

Register	Designation	type	Comment	Scale
24		Uint	Alarm 6-1 Word	
	.0	Bool	Alarm 6-1 Bottom drain valve fail closed	
	.1	Bool	Alarm 6-2 Bottom drain valve fail stuck	
	.2	Bool	Alarm 6-3 Bottom drain valve fail opening speed	
	.3	Bool	Alarm 6-4 Condensate isolation valve fail open	
	.4	Bool	Alarm 6-5 Condensate isolation valve fail closed	
	.5	Bool	Alarm 6-6 Condensate isolation valve fail stuck	
	.6	Bool	Alarm 6-7 Condensate isolation valve fail opening speed	
	.7	Bool	Alarm 6-8 Saturation pressure temperature limit	
	.8	Bool	Alarm 6-9 HMI communications fault	
	.9	Bool	Alarm 6-10 Cold negative leak test alarm	
	.10	Bool	Alarm 6-11 Cold positive test max count	
	.11	Bool	Alarm 6-12 Drain water hot	
	.12	Bool	Alarm 6-13 Emergency stop PB	
	.13	Bool	Alarm 6-14 Pre-heater thermal cycles limit	
	.14	Bool	spare	
	.15	Bool	spare	
25		Uint	Run status	x1
26		Uint	Command watchdog out	x1

Input

Register	Designation	type	Comment	Scale
27		Uint	Command watchdog return	x1
28		Uint	Command word	
	.0	Bool	Communications control Start	
	.1	Bool	Communications control Stop	
	.2	Bool	spare	
	.3	Bool	spare	
	.4	Bool	spare	
	.5	Bool	spare	
	.6	Bool	spare	
	.7	Bool	spare	
	.8	Bool	spare	
	.9	Bool	spare	
	.10	Bool	spare	
	.11	Bool	spare	
	.12	Bool	spare	
	.13	Bool	spare	
	.14	Bool	spare	
	.15	Bool	spare	
29		INT	Remote clean steam pressure set-point	x100

Appendix 1

- C1 BACnet IP - ADF™ HW67673-IP-A1

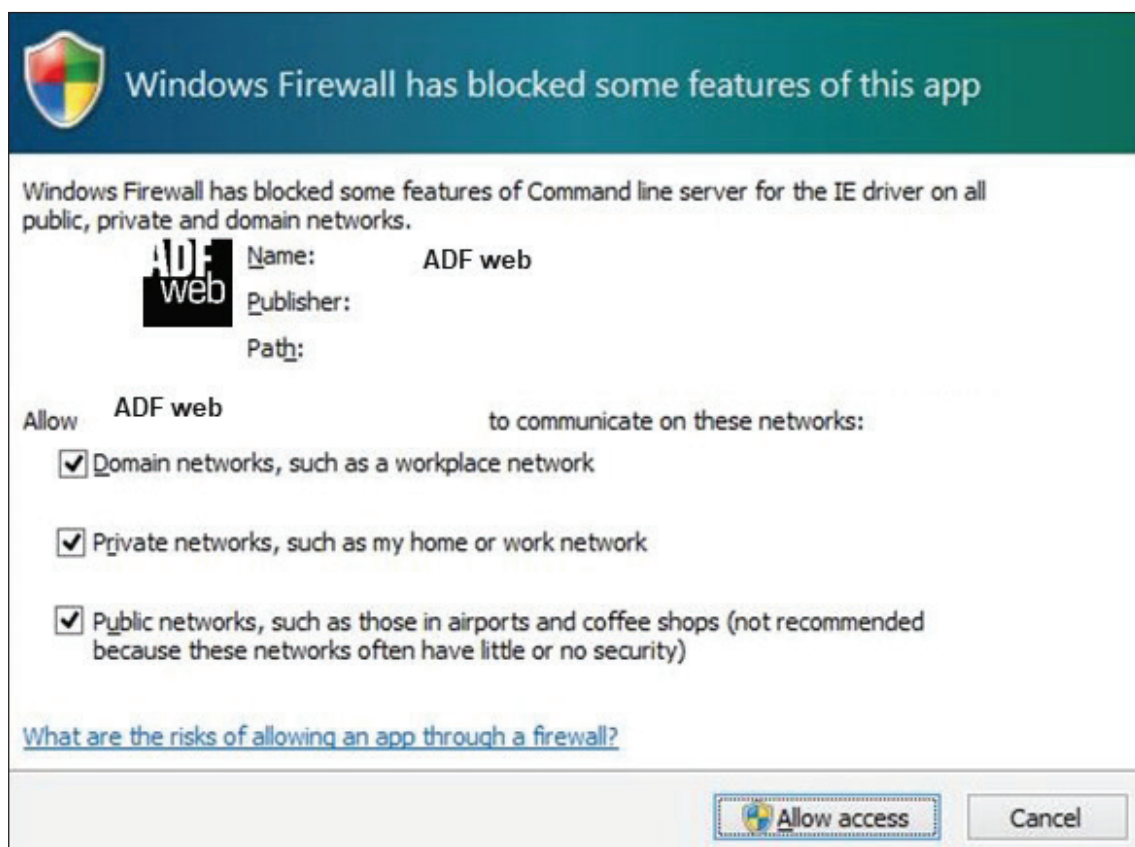
Software for the C1 option can be obtained from the ADF™ website.

Manual : http://www.adfweb.com/download/filefold/mn67673_eng.pdf

Software : <http://www.adfweb.com/download/filefold/sw67673.zip>

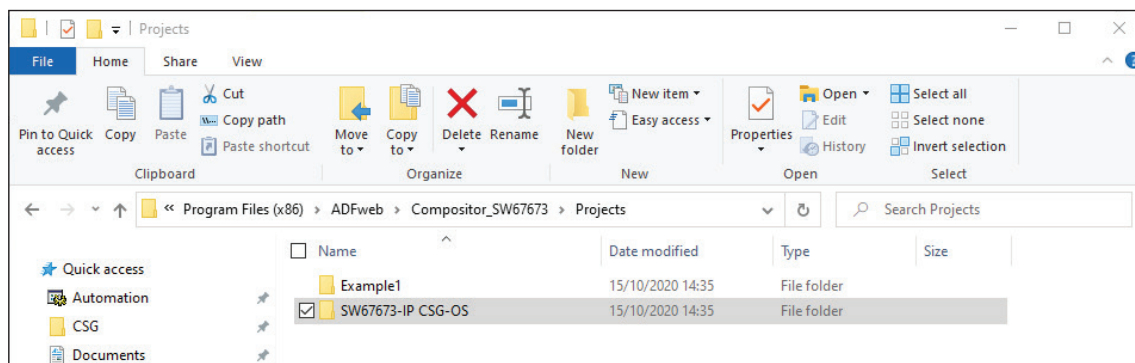
Follow the instructions for the installation of the software.

IMPORTANT : When opening the software for the first time, enable connection to public, private and domain networks.



Once the software is installed, the configuration for the CSG will need to be stored in the correct location. The configuration is available from Spirax Sarco.

The folder and its contents will need to be copied into the following folder:
C:\Program Files (x86)\ADFweb\Compositor_SW67673\Projects



Open the software and load the SW67673 IP CSG-OS configuration. The 'Set communications' button will allow users to edit the settings for the external connection.

Follow the software instructions and load the software into the module.

Appendix 2

- C2 Profinet - ADF™ HW67611-A1

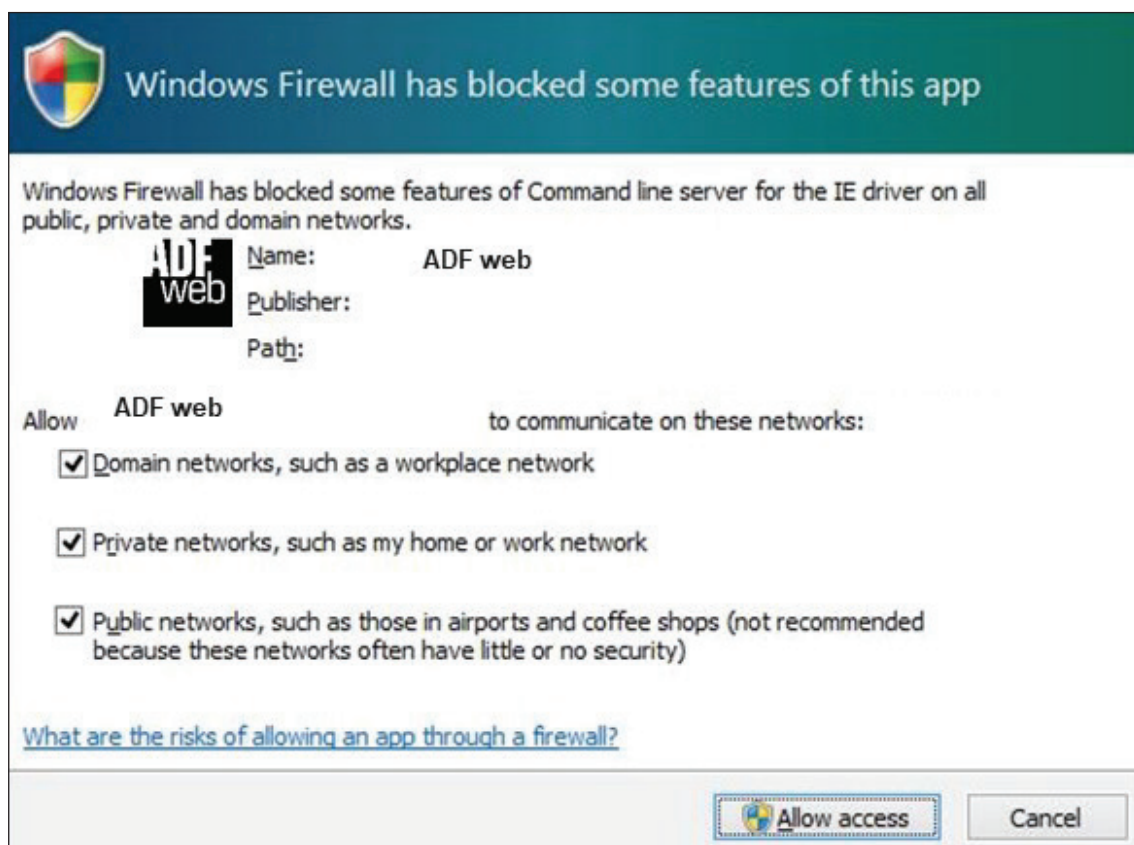
Software for the C2 option can be obtained from the ADF™ website.

Manual : http://www.adfweb.com/download/filefold/mn67611_eng.pdf

Software : <http://www.adfweb.com/download/filefold/sw67611.zip>

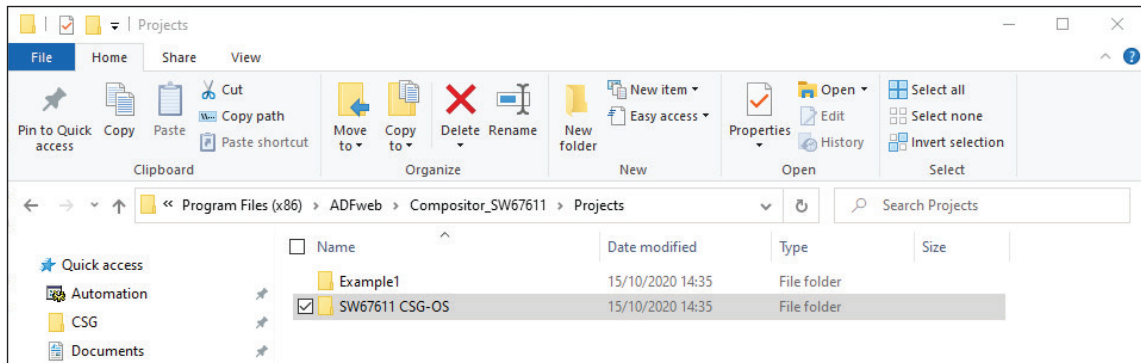
Follow the instructions for the installation of the software.

IMPORTANT : When opening the software for the first time, enable connection to public, private and domain networks.



Once the software is installed, the configuration for the CSG will need to be stored in the correct location. The configuration is available from Spirax Sarco.

The folder and its contents will need to be copied into the following folder:
C:\Program Files (x86)\ADFweb\Compositor_SW67611\Projects



Open the software and load the SW67611 CSG-OS configuration. The 'Set communications' button will allow users to edit the settings for the external connection.

Follow the software instructions and load the software into the module.

Appendix 3

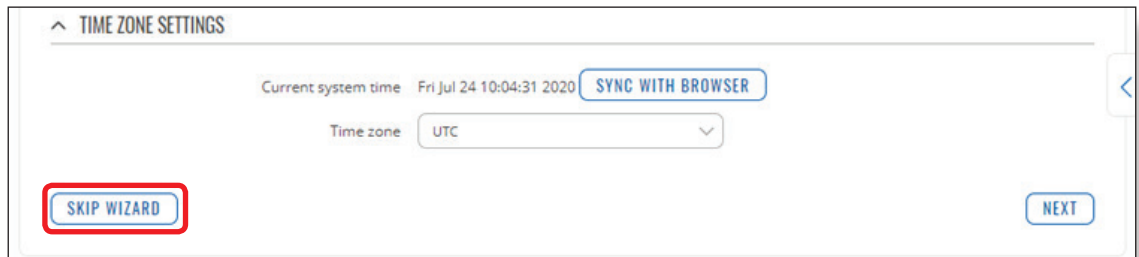
- C3 Modbus TCP/IP – Teltonika RUTX08

The backup file for the RUTX08 router is available from Spirax Sarco.

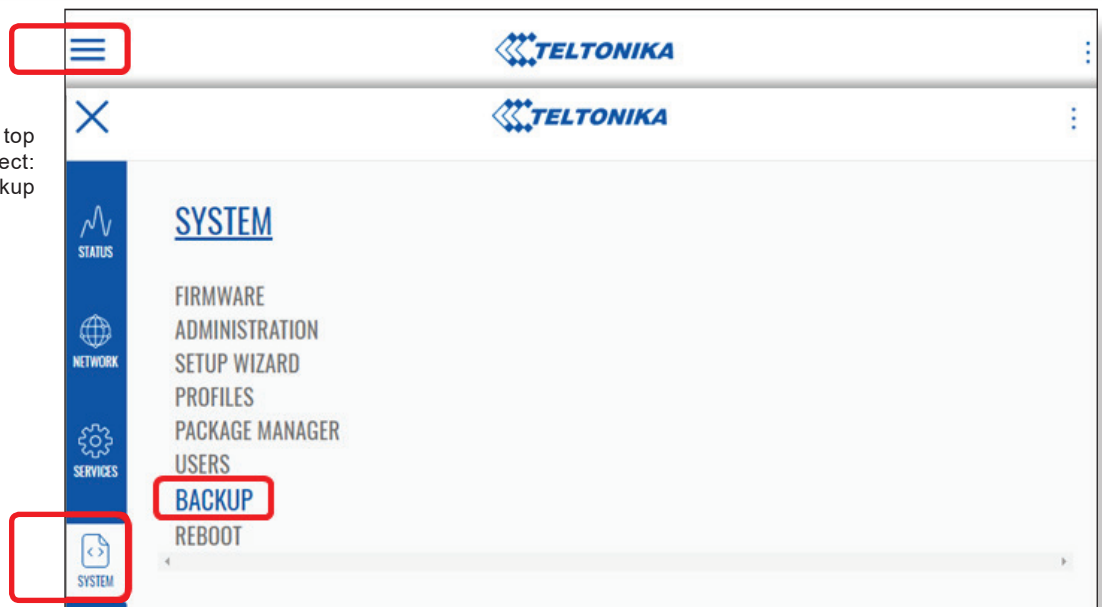
The Instruction manual for the router can be found here: https://wiki.teltonika-networks.com/view/RUTX08_First_Start

Complete the First start procedure remembering to record the password.

Skip the setup wizard when it appears



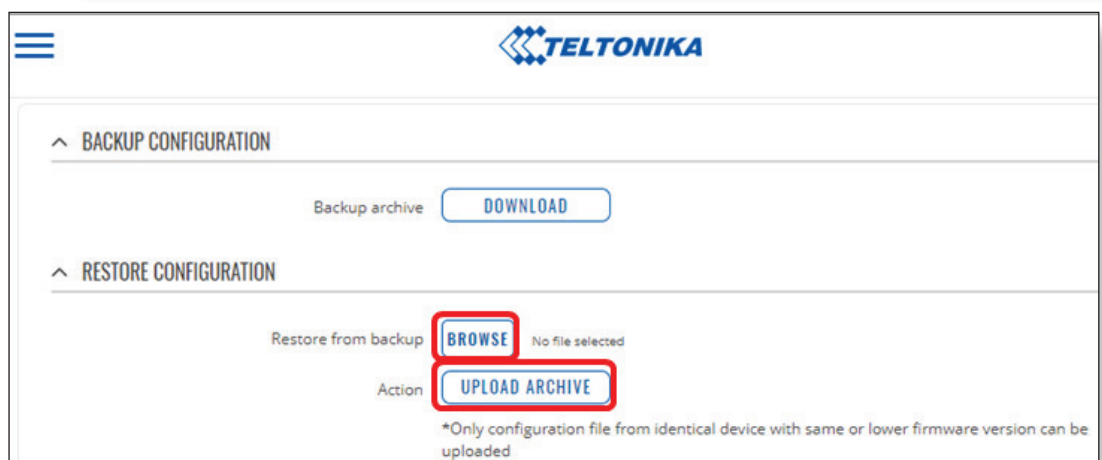
Open the menu at the top of the screen and select: System > Backup



Select browse and select the correct configuration file

Select Upload Archive

The router is now configured to receive its network identification for a DHCP server.



Appendix 4

- C4 BACnet MSTP - ADF™ HW67673-MSTP-A1

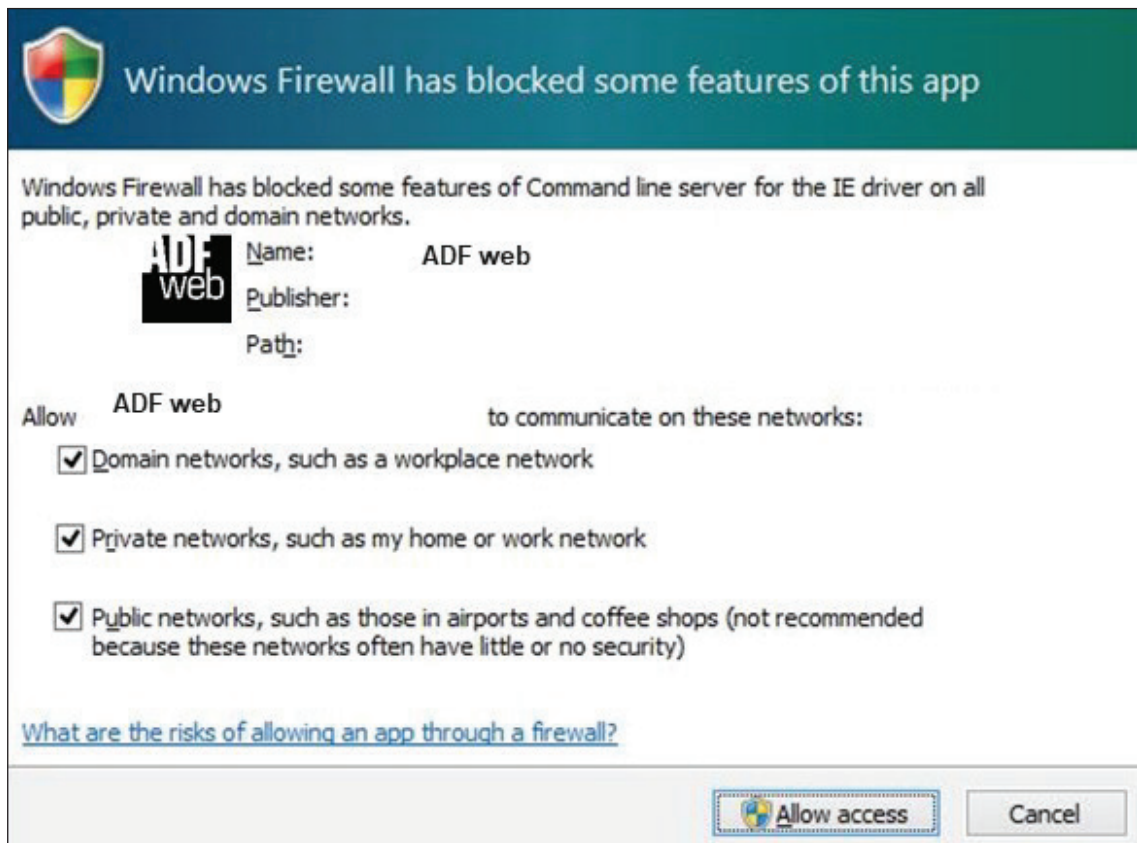
Software for the C4 option can be obtained from the ADF™ website.

Manual : http://www.adfweb.com/download/filefold/mn67673_eng.pdf

Software : <http://www.adfweb.com/download/filefold/sw67673.zip>

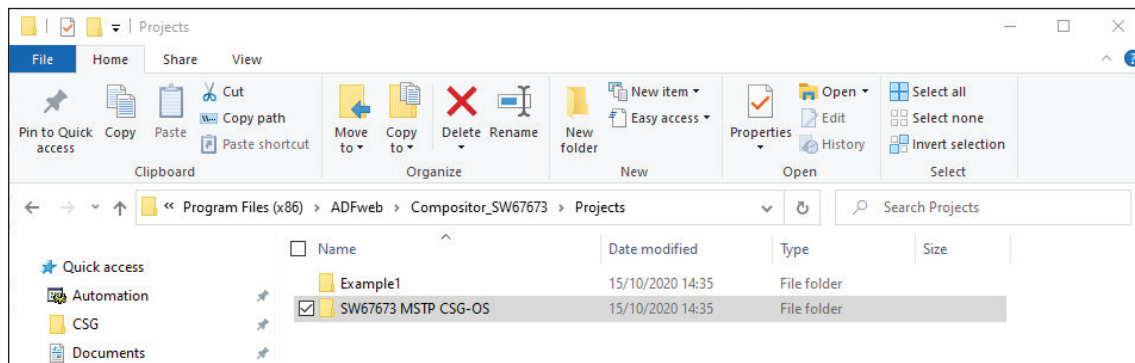
Follow the instructions for the installation of the software.

IMPORTANT : When opening the software for the first time, enable connection to public, private and domain networks.



Once the software is installed, the configuration for the CSG will need to be stored in the correct location. The configuration is available from Spirax Sarco.

The folder and its contents will need to be copied into the following folder:
C:\Program Files (x86)\ADFweb\Compositor_SW67673\Projects



Open the software and load the SW67673 MSTP CSG-OS configuration. The 'Set communications' button will allow users to edit the settings for the external connection.

Follow the software instructions and load the software into the module.

Appendix 5

- C5 Profibus - ADF™ HW67564-A1

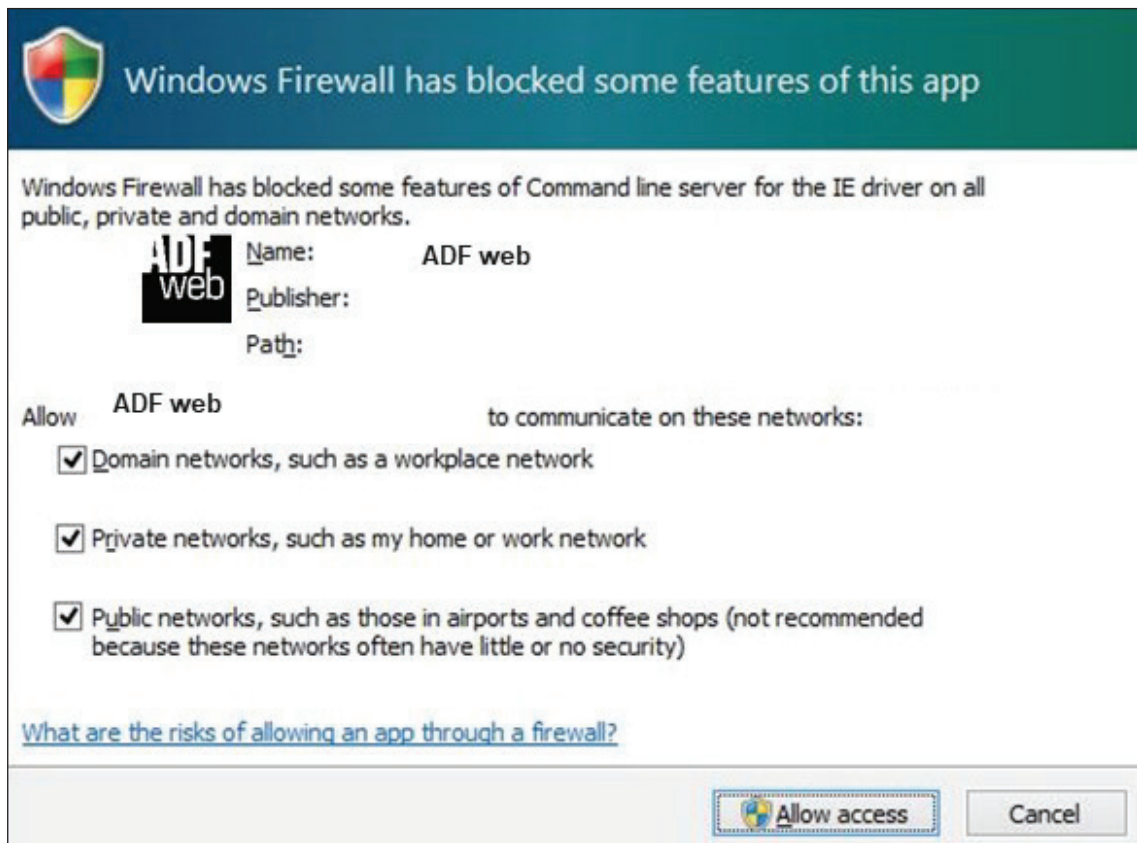
Software for the C5 option can be obtained from the ADF™ website.

Manual : http://www.adfweb.com/download/filefold/mn67564_eng.pdf

Software : <http://www.adfweb.com/download/filefold/sw67564.zip>

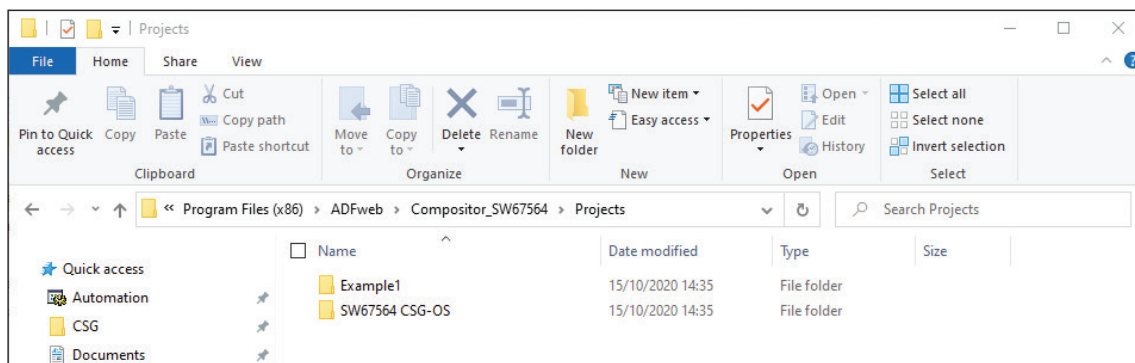
Follow the instructions for the installation of the software.

IMPORTANT : When opening the software for the first time, enable connection to public, private and domain networks.



Once the software is installed, the configuration for the CSG will need to be stored in the correct location. The configuration is available from Spirax Sarco.

The folder and its contents will need to be copied into the following folder:
C:\Program Files (x86)\ADFweb\Compositor_SW67564\Projects



Open the software and load the SW67564 CSG-OS configuration. The 'Set communications' button will allow users to edit the settings for the external connection.

Follow the software instructions and load the software into the module.

Appendix 6

- C6 Modbus RTU - ADF™ HW67510-A1

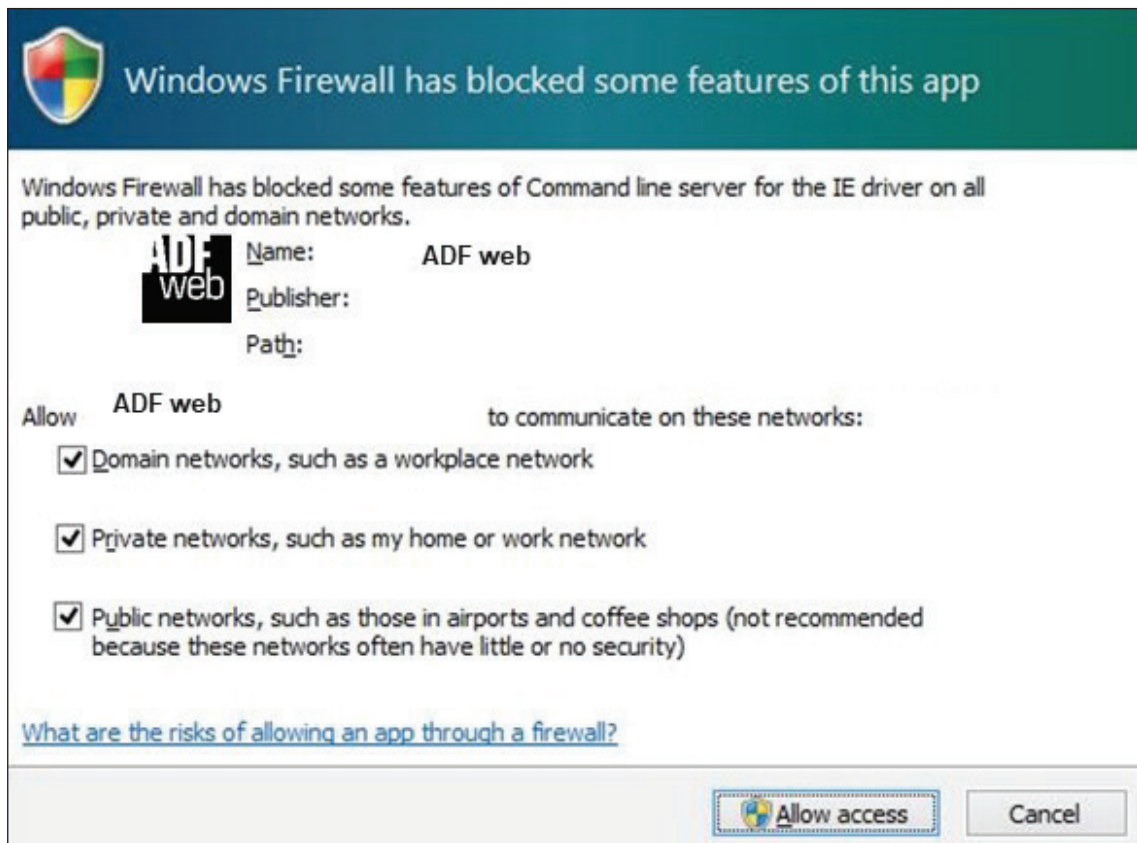
Software for the C6 option can be obtained from the ADF™ website.

Manual : http://www.adfweb.com/download/filefold/mn67510_eng.pdf

Software : <http://www.adfweb.com/download/filefold/sw67510.zip>

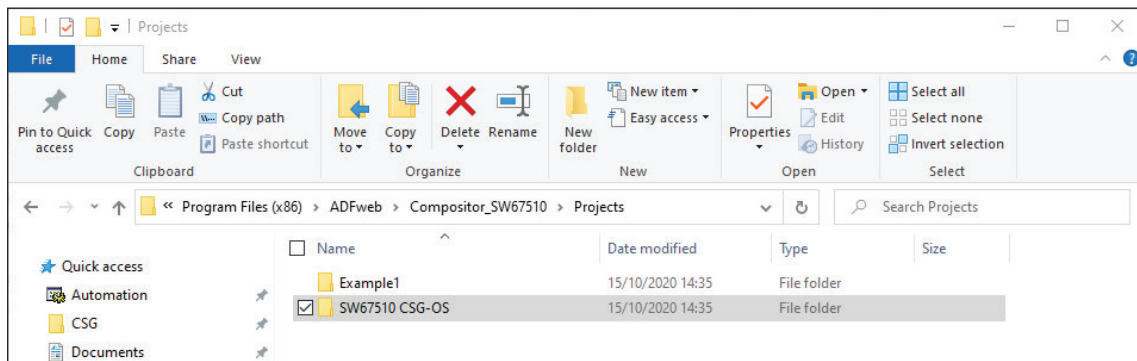
Follow the instructions for the installation of the software.

IMPORTANT : When opening the software for the first time, enable connection to public, private and domain networks.



Once the software is installed, the configuration for the CSG will need to be stored in the correct location. The configuration is available from Spirax Sarco.

The folder and its contents will need to be copied into the following folder:
C:\Program Files (x86)\ADFweb\Compositor_SW67510\Projects



Open the software and load the SW67510 CSG-OS configuration. The 'Set communications' button will allow users to edit the settings for the external connection.

Follow the software instructions and load the software into the module.

Appendix 7

- C7 BACnet IP (BTL) - Teltonika RUTX08

Please refer to **Appendix C3**.

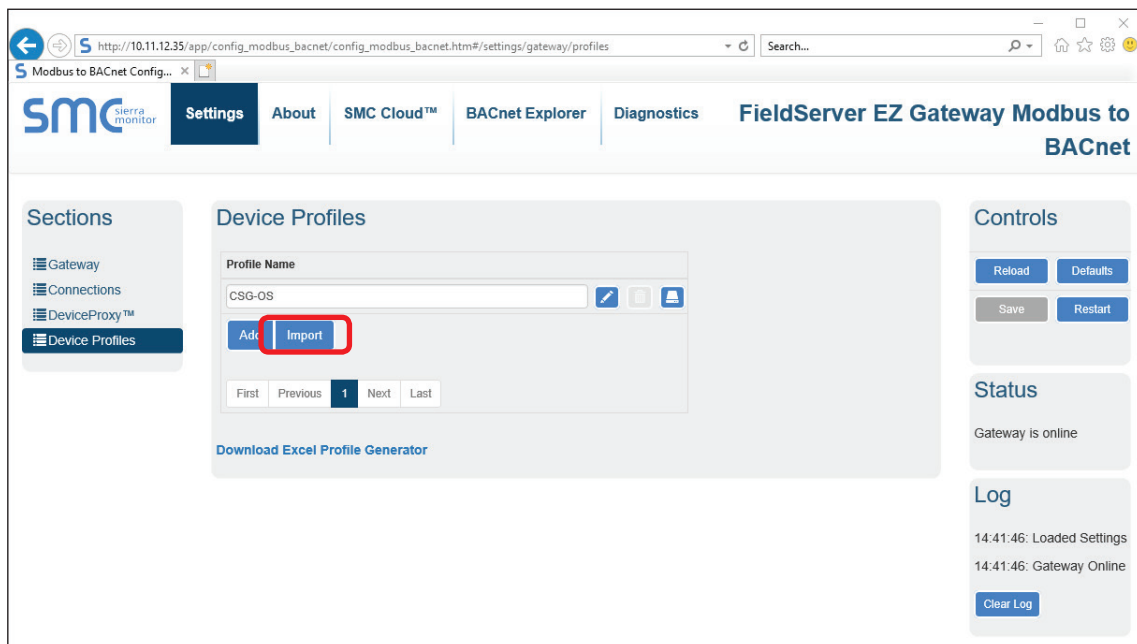
- Sierra Monitor™ EZ

The manual for the C7 module can be found on the SMC website

https://www.sierramonitor.com/downloads/Start-Up_Guide-EZ_Gateway_Modbus_to_BACnet

Follow the instructions for connecting to the gateway via Ethernet (Section 5.1) and reaching the Web Configurator GUI (Section 5.2).

Navigate to the Device Profiles (section 6.2) and select the Import button to load the CSG-OS profile. The profile for the C7 module is available from Spirax Sarco.



Once the device profile has been loaded, use the Save button to restart the module with the new settings loaded.

Navigate to the DeviceProxy and input the below settings into the C7 module.

The screenshot shows the DeviceProxy™ web interface. At the top, there's a header with the logo. Below it is a table with columns: Device Profile, Modbus Connection, BACnet Connection, Modbus Node ID, Modbus Node IP Address, Modbus Node IP Port, BACnet Device Instance, BACnet Device Name, and Advanced. The first row contains the following values: 1, CSG-OS (dropdown), N1 (Modbus) (dropdown), N1 (BACnet) (dropdown), 1, 10.11.12.33, 502, 0, CSG-OS, and an eye icon. Below the table is an 'Add' button and a pagination bar with 'First', 'Previous', '1' (selected), 'Next', and 'Last'.

	Device Profile	Modbus Connection	BACnet Connection	Modbus Node ID	Modbus Node IP Address	Modbus Node IP Port	BACnet Device Instance	BACnet Device Name	Advanced
1	CSG-OS	N1 (Modbus)	N1 (BACnet)	1	10.11.12.33	502	0	CSG-OS	

Buttons: Add, First, Previous, 1, Next, Last

Navigate to the Gateway, select the IP Settings and input the below settings into the C7 module.

The screenshot shows the Gateway configuration interface. It has two main sections: 'General' and 'Network'. In the 'General' section, the 'Title' is 'Modbus to BACnet EZ Gateway'. In the 'Network' section, there are two sub-sections: 'IP Settings' and 'Passwords'. The 'IP Settings' sub-section is expanded, showing a form with the following fields: N1 DHCP Client State (checkbox), N1 IP Address (10.11.12.35), N1 Netmask (255.255.255.0), Default Gateway (10.11.12.36), Domain Name Server 1 (0.0.0.0), and Domain Name Server 2 (0.0.0.0). At the bottom right of the form are 'Save' and 'Refresh' buttons.

General

Title: Modbus to BACnet EZ Gateway

Network

IP Settings

Passwords

IP Settings

N1 DHCP Client State ☐

N1 IP Address: 10.11.12.35

N1 Netmask: 255.255.255.0

Default Gateway: 10.11.12.36

Domain Name Server 1: 0.0.0.0

Domain Name Server 2: 0.0.0.0

Buttons: Save, Refresh

Once the device profile has been loaded, use the Save button to restart the module with the new settings loaded.

Appendix 8

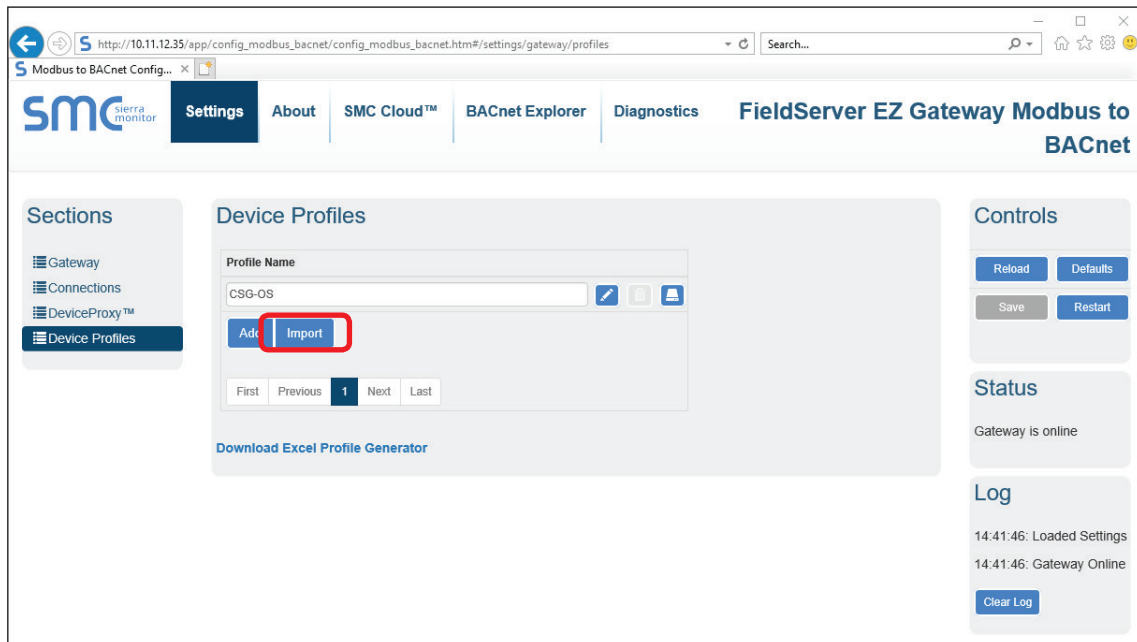
C8 BACnet MSTP (BTL)

The manual for the C7 module can be found on the SMC website

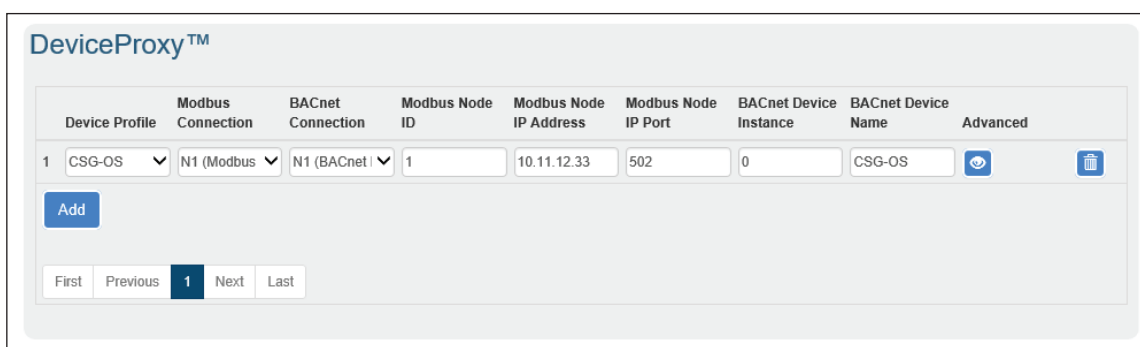
https://www.sierramonitor.com/downloads/Start-Up_Guide-EZ_Gateway_Modbus_to_BACnet

Follow the instructions for connecting to the gateway via Ethernet (Section 5.1) and reaching the Web Configurator GUI (Section 5.2).

Navigate to the Device Profiles (section 6.2) and select the Import button to load the CSG-OS profile. The profile for the C7 module is available from Spirax Sarco.



Navigate to the DeviceProxy and input the below settings into the C7 module.



Navigate to the Connections settings (section 6.1) and modify BACnet MSTP R1 section to suit the external connection requirements.

The screenshot shows the 'FieldServer EZ Gateway Modbus to BACnet' configuration page. The 'Connections' section is active in the left sidebar. The main area contains several configuration panels:

- Modbus RTU R1:** Enable checkbox, Port (R1), Baud Rate (9600), Parity (None), Data Bits (8), Stop Bits (1), Poll Delay (0.1).
- Modbus TCP:** Enable checkbox, Poll Delay (0.1), Max Concurrent Messages (1).
- BACnet IP:** Enable checkbox, IP Port (47000), Enable SIMU checkbox, Public IP Address (192.168.0.1), Broadcast Distribution Table checkbox.
- BACnet IP Settings:** Virtual Network Number (1100), Internal Network Number 1 (1200), Internal Network Number 2 (1201).
- BACnet MSTP Settings:** Virtual Network Number (1101), Internal Network Number 1 (1202), Internal Network Number 2 (1203).
- BACnet MSTP R1:** Enable checkbox, Baud Rate (19200), Parity (None), Data Bits (8), Stop Bits (1), Mode (Master), Max Master (127), Max Info Frames (1), MAC Address (1).
- BACnet MSTP R2:** Enable checkbox, Baud Rate (19200), Parity (None), Data Bits (8), Stop Bits (1), Mode (Master), Max Master (127), Max Info Frames (1), MAC Address (2).
- Controls:** Reload, Defaults, Save, Restart buttons.
- Status:** Gateway is online.
- Log:** 14:41:46: Loaded Settings, 14:41:46: Gateway Online, Clear Log button.

Navigate to the DeviceProxy and input the below settings into the C7 module.

The screenshot shows the 'DeviceProxy™' configuration page. It features a table with the following columns: Device Profile, Modbus Connection, BACnet Connection, Modbus Node ID, Modbus Node IP Address, Modbus Node IP Port, BACnet Device Instance, BACnet Device Name, and Advanced. The table contains one entry:

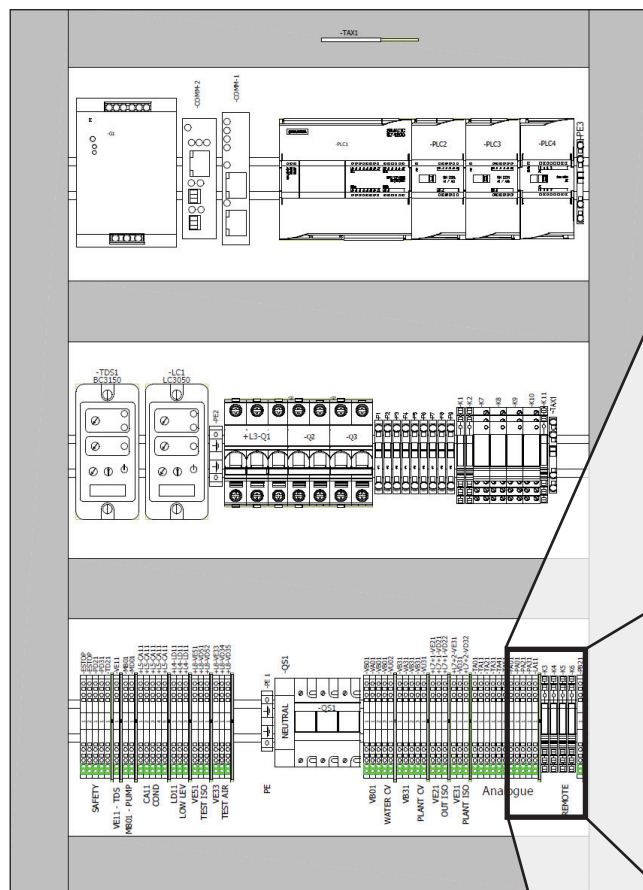
Device Profile	Modbus Connection	BACnet Connection	Modbus Node ID	Modbus Node IP Address	Modbus Node IP Port	BACnet Device Instance	BACnet Device Name	Advanced
1 CSG-OS	N1 (Modbus)	N1 (BACnet)	1	10.11.12.33	502	0	CSG-OS	[Eye icon] [Trash icon]

Below the table is an 'Add' button and a pagination control showing 'First', 'Previous', '1', 'Next', and 'Last'.

Once the device profile has been loaded, use the Save button to restart the module with the new settings loaded.

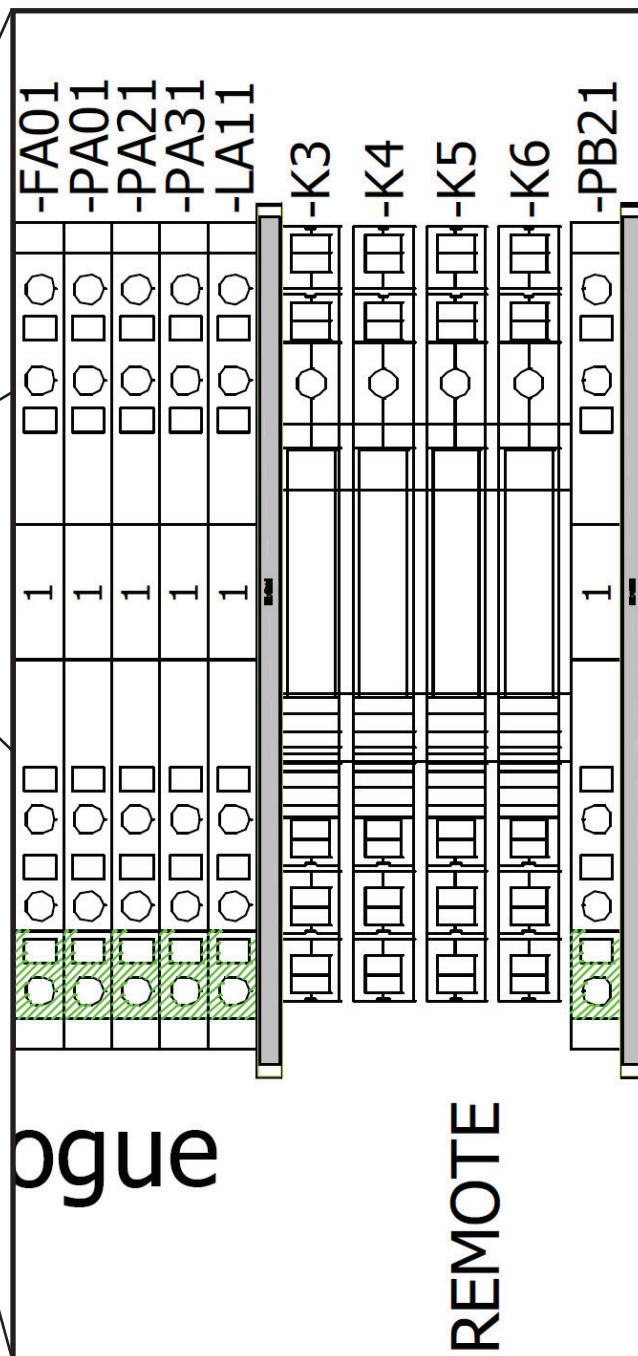
Appendix D

Terminals for remote connections can be found in the bottom right of the control panel



From page 47 of wiring diagram

Expansion from page 47 of wiring diagram



Connection	Position	Terminals	N/O	N/C
Remote start	K5	A1	A2	-
Remote stop	K6	A1	A2	-
Run status relay	K3	11	14	12
Alarm status relay	K4	11	14	12

Connection	Position	Terminals	Terminals
Clean steam retransmission	PB21	PB21+	24V0

