PABP USER MANUAL - PRELIMINARY
Photoelectric Amplifier Bus Programmable Series (PABP)
Multiplexed photoelectric amplifier

EN

Product Data

Electrical Data	
Supply voltage	10-30 V dc / 24V ac
Power consumption	Max. 3.6 VA
Output: solid state	30 V dc / 100 mA
Alarm output: solid state	30 V dc / 100 mA

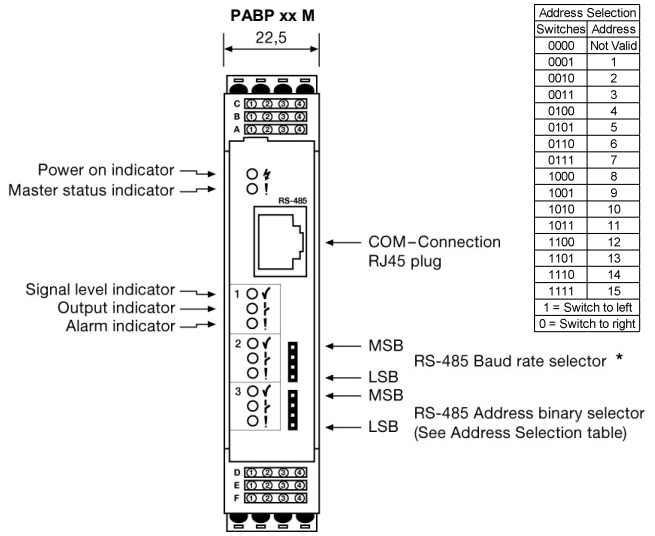
Environmental Data	
Temperature, operation	-10 to +50 °C
Sealing class	IP 40
Approvals	CE

Applicable Remote Sensors & Sensing Ranges for Manual Gain mode	
Remote Sensor Series	Sensing Range
100	12 m
110	27 m
120	47 m

Comments: The range is reduced to 30 % in short range mode.

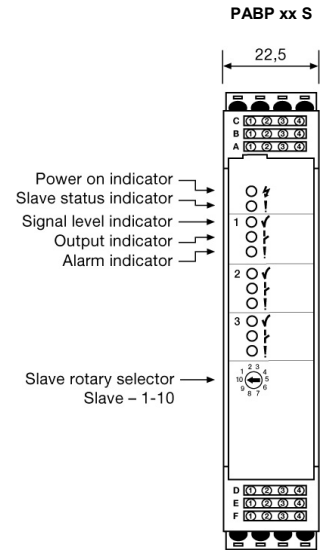
Applicable Remote Sensors & Sensing Ranges for Auto Gain mode		
Remote Sensor Series	Sensing range	
	Short range	Long range
100	0.4 m – 4 m	1 m – 10 m
110	0.9 m – 9 m	2.2 m – 22 m
120	1.6 m – 16 m	3.9 m – 39 m

Illustration



Address Selection	
Switches	Address
0000	Not Valid
0001	1
0010	2
0011	3
0100	4
0101	5
0110	6
0111	7
1000	8
1001	9
1010	10
1011	11
1100	12
1101	13
1110	14
1111	15
1 = Switch to left	
0 = Switch to right	

*** Note:** Baud rate selector is disabled for this series. Baud rate is set to 19200 bps for optimum functionality.



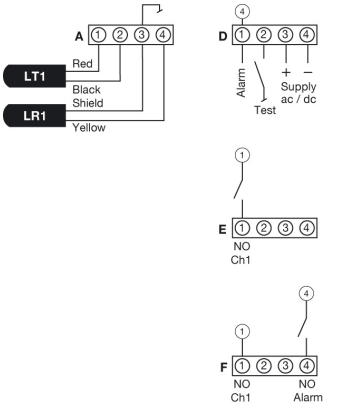
Indicators	
Power On	Green light when power is on
Master Status Indicator	Green light when amplifier is working as master
	Green flashing light if amplifier is master and in error state
Slave Status Indicator	Orange light when amplifier is slave
	Orange flashing light if amplifier is slave and in error state
Signal OK / Regulation Indicator	Green light when signal is sufficient and beam is unbroken
	Only Auto Gain Mode: Green light when signal beam is unbroken and still room for increasing transmission power. Green light is flashing during adjustment excess gain.
Output	Yellow light when output is activated
LT/LR error	Red light for light transmitter error (disconnection or shorted)
	Yellow light for light receiver error (disconnection or shorted)
	Yellow and red light flashes for insufficient signal level (for instance caused by contamination on sensors)
	Only Auto Gain Mode: Yellow and red light flashes if target excess gain is not obtained and transmission power is maximum

Selectors	
Slave address selector	Select addresses 1,...,10 to set the amplifier address. Each of the slaves must have a separate address in sequence starting from 1.

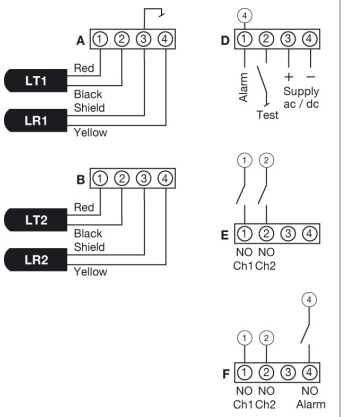
Connection

Wiring Diagrams

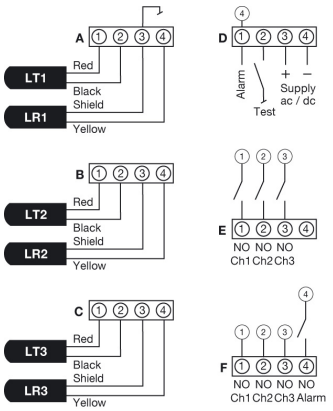
PABP 10 – 1 Channel



PABP 20 – 2 Channel

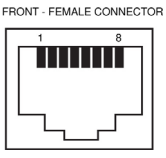


PABP 30 – 3 Channels



Note: All outputs and alarm output are N.O. when the system is not powered.

RJ 45 wiring



Pin on RJ45	MODBUS IDv/ltr	EIA/TIA RS 485	Description
4	D1	B/B' or B +	Signal
5	DO	A/A' or A -	Signal
8	Common	C/C'	Ground

Website: www.telcosensors.com
E-Mail: info@telcosensors.com
Made in Denmark

Warning

This product is not a safety system and must not be used as such.
It is not designed for personnel safety applications, and must not be used as a stand alone personnel safety system.

V 1.24 Preliminary Part Number: 0666220602
September 2012 edition

Output Logic			
Detection (thru beam)	Output mode	Solid state relay Output	Output indicator
Object present 	Dark operated	Closed	On
	Light operated	Open	Off
Object absent 	Dark operated	Open	Off
	Light operated	Closed	On

Connection Steps	
1	Check the power supply complies with electrical data.
2	Make sure power is off. Connect the amplifiers using the special bus connectors.
3	Mount the amplifiers in the DIN rail. And connect all wires to the terminals according to wiring diagrams. Connect the power supply only to the Master. The slaves are supplied by the master via the bus connector.
4	Select separate addresses for each Slave amplifier and RS485 address for the Master amplifier. Switch power on.
5	Connect the master to a PC, with control software installed.

Notes: **- Do not connect** wires for power supply if a PPB power supply is used. The PPB will supply the amplifier through the bus.

Test Input

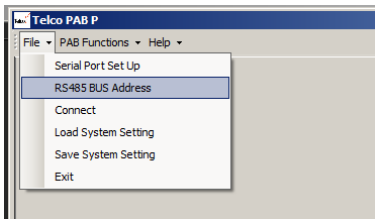
The transmitter is disabled if the test input is connected to the internal ground ⊥ (A3). Make sure no object is present in the detection area, between remote transmitter and receiver sensor, when test is activated. When the transmitter is disabled, a change in output should occur.

Alarm output

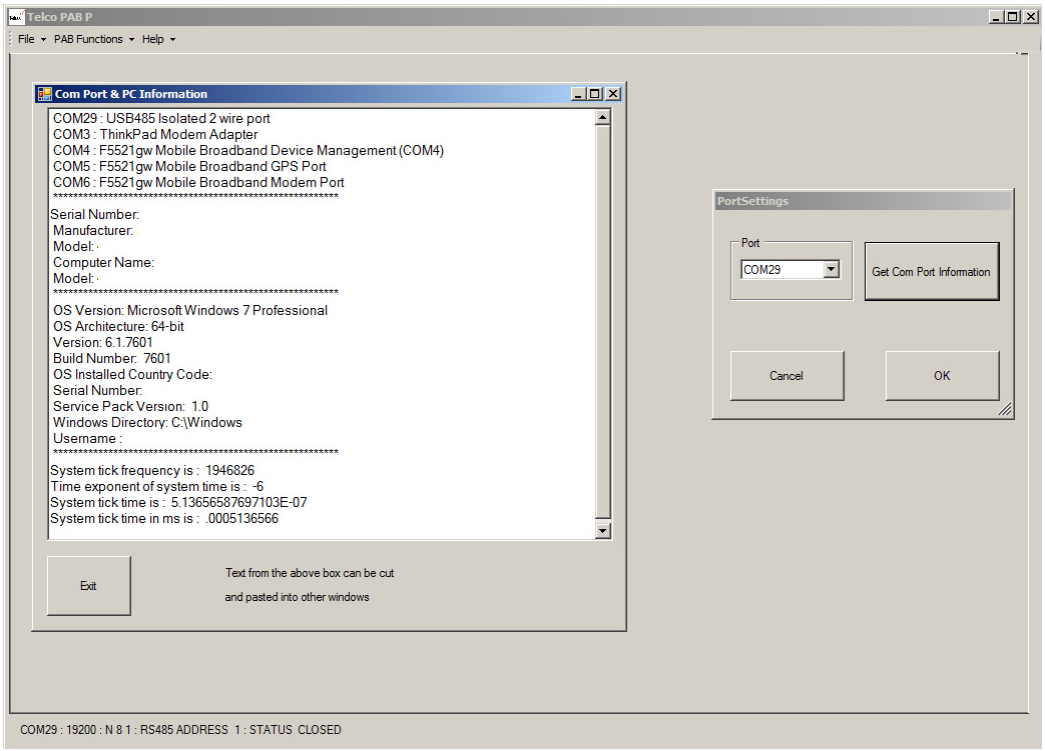
The alarm output voltage of D1 is high if the amplifier does not indicate errors and low if it indicates an error. The indicated errors are: master/slave error, LT/LR error and insufficient signal level. In the case of insufficient signal level the alarm output is flashing.

PABP and PC connection

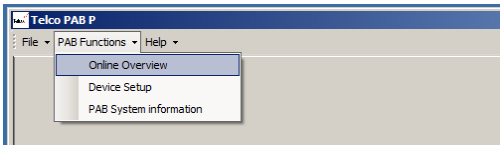
To setup or adjust a PABP it is required to use the Telco PAB Terminal software together with an RS485 data link.



1. Start by selecting the **Serial Port Set Up** and select the correct Port to communicate with the PABP. If the Port number is not known it is possible to press the **Get Com Port Information**. This will list all COM Ports used by the PC.(Full Com port details in Win7, WiNXP only basic details are shown)



2. Next press Connect and wait a few seconds before the connection is active.
3. To see status of all channels go to **On line Overview**. To setup an amplifier and its associated channels, go to **Device Setup**.



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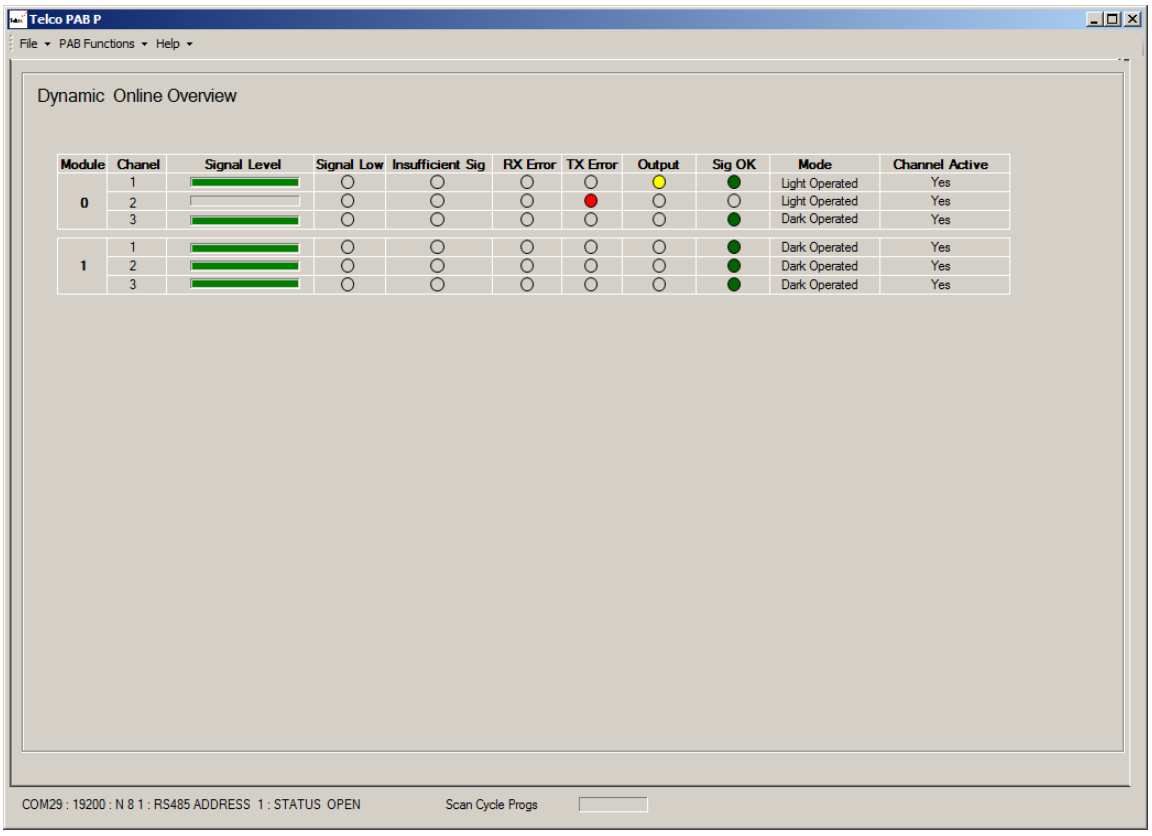
Online Overview

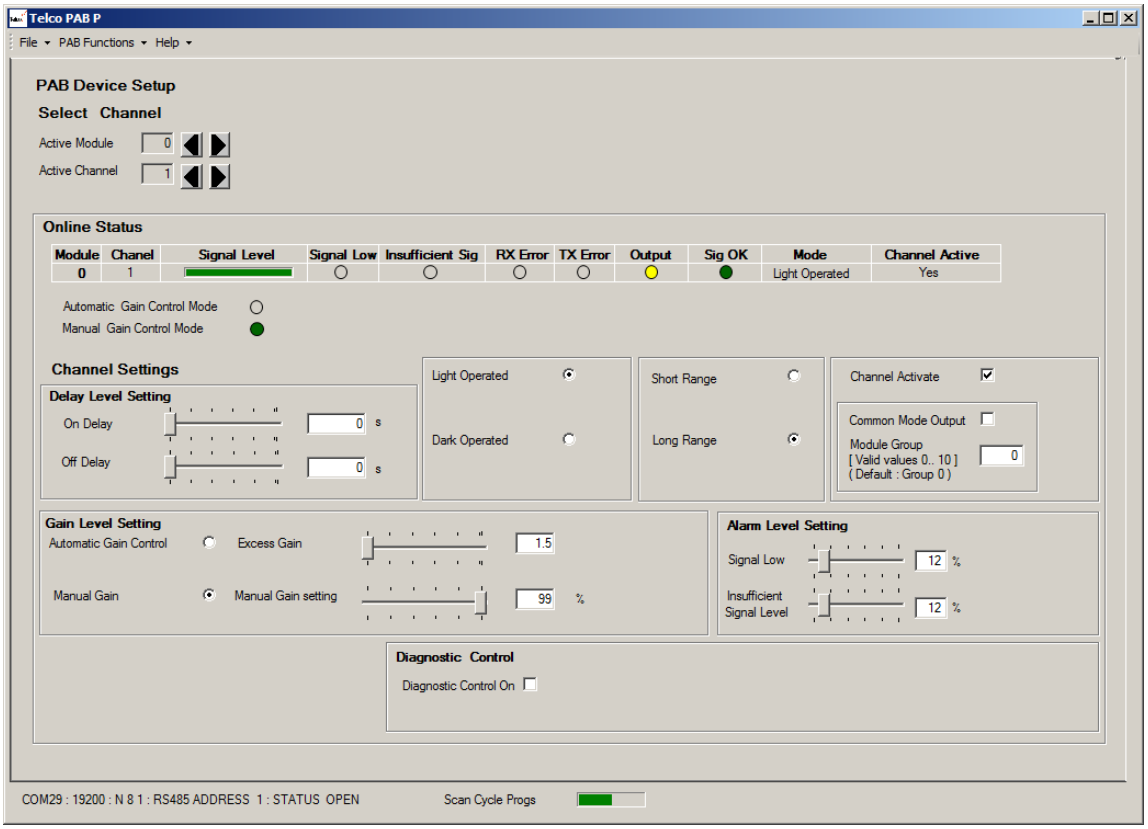
The picture below show the Online Overview of all channels present on the system. No settings can be made from this window.



PABP Device Setup

The picture below show the **PABP Device Setup** window. All settings for an amplifier except slave address and RS485 address for the master are done from this window. To select an amplifier use the buttons under **Select Channel** to acces an amplifier and its channels. The master is always module 0. This window also show the same information for a channel as in Online Overview.

The Common Mode Output and Module Group settings are only shown on channel 1 of any module.



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Adjustments

Manual Gain Mode Adjustment

Gain can be adjusted in two large steps with long/ short range selected or continuously with the **Manual Gain Setting** bar. Maximum gain and long range can be used for most applications and is advised for applications with contaminated environments e.g. dirt, water and dust.
Chose long range and increase the gain to maximum by sliding the **Manual Gain Setting** bar to a 100% reading.

More accurate sensitivity adjustment may be required in applications where objects to be detected are small or translucent. Proceed with the following steps:

1	Make sure there is no object present between remote transmitter and receiver sensors.
2	Select long or short range according to application.
3	Increase gain slowly from minimum (0%) until the yellow output indicator changes. Increase a little further until the green Signal OK indicator is on.
4	Select target object with smallest dimensions and most translucent surface.
5	Place target object between remote transmitter and receiver sensors. If the output changes, the gain is adjusted correct. If the output do not change proceed to step 6.
6	Remove the object and decrease the gain by sliding the “Manual Gain Bar” towards 0% until the green Signal OK indicator is off and the LT/LR error indicator flashes simultaneously with red and yellow light
7	Place target object between remote transmitter and receiver sensors. If the output changes, the gain is adjusted to suit the target but the adjustment is very delicate and not advisable, please contact your vendor for further information.
	If the signal level is insufficient, the LT/LR error indicator flashes simultaneously with red and yellow light. Check the following:
	Check alignment of sensors
	Check transmitter and receiver sensors are within sensing range
	Check gain adjustment
	Check sensor heads are not excessively contaminated

Auto Gain Mode Adjustment

This amplifier automatically compensates for reduction in transmission power due to dirt on sensors, etc, by increasing the transmission power correspondingly. Adjust excess gain with the following steps:

1	Make sure there is no object present in the beam between remote transmitter and receiver sensors.
2	Turn the slider **Excess Gain** bar to 3.2 (max excess gain)
3	Wait for regulation indicator to stop blinking, and initialization is finished. If this never happens, the reason can be that the environment or the sensors are too contaminated, the distance between transmitter and receiver is too large, or the sensors are misaligned.
4	Insert the smallest and most translucent object into the beam. **If the output changes, the setting is correct.** If the output does not change, proceed with step 5.
5	Remove the object, decrease excess gain slightly by sliding the **Excess Gain** bar towards 1.5 (lowest excess gain). If more adjustments have been done and it is not possible to decrease excess gain further, the object cannot be detected with the given setup. Please contact the vendor for further advice.
6	Wait for the regulation indicator to stop blinking (finished new initialization).
7	Go to step 4

Alarm Level Setting

It is possible to manually adjust two alarm levels. **Signal Low** and **Insufficient Signal Level**. These are in direct relation to the **Signal Level** bar so when adjusting the alarm levels means that when the signal is below that value the alarm is triggered and displayed on the **Online Overview** and **PABP Device Setup**.

Turning off a channel

It is possible to turn of the PABPs channels. This is done by unchecking the **Channel Activate** checkbox. The channel will then be completely ignored by the PABP.

Delay Level Setting

The **On Delay** enables output signal to only activate if an object in the detection area is present for the adjusted time period. The **Off delay** enables output signal to remain activated for the adjusted time period. The time delay is adjustable between 0-10 s.

Diagnostic Control

Besides the hardware test input which disables the transmitter for all channels on the amplifier, is it also possible to use a test input for each channel on the amplifier. The outputs can also be controlled individually to be ON or OFF. Doing this will ignore that channel and the rest is still multiplexed. This is all controlled from the **Diagnostic Control** window. Shown in the next picture.

1	Check the **Diagnostic Control On** checkbox. The program will come up with a warning textbox and all other controls will be disabled.
2	Either use **Test Input**, which will test a complete transmitter – receiver chain. This is done by **Transmitter Diagnostics**, with no objects in the beam.
3	Or **Enable Forced Output** to manually force the outputs On or OFF. Forced output allows the user to test the outputs even if the beam is blocked.
4	To return to normal mode uncheck the **Diagnostic Control On** checkbox.

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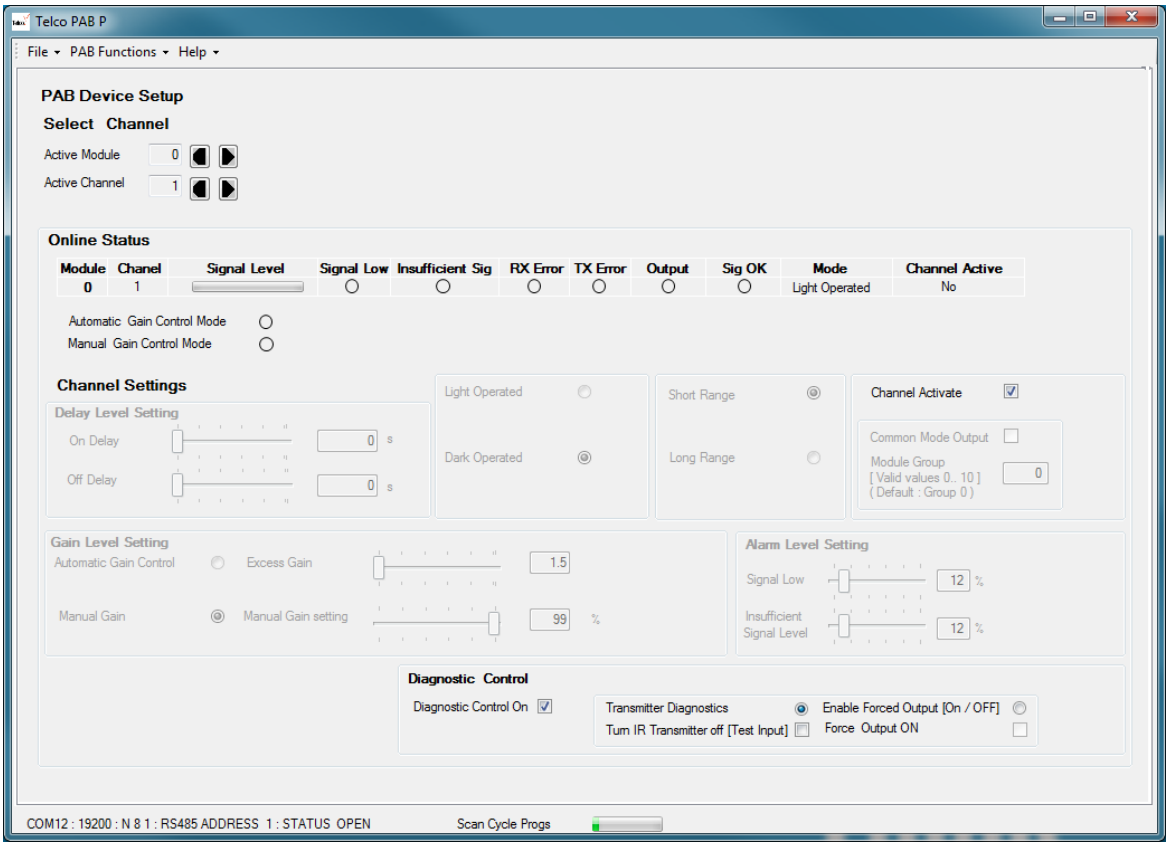

Operation Modes

Common Output

The **Common Mode Output** selector is used to obtain common or individual output from one or more amplifiers. If **Common Mode Output** is selected for the master and a number of slaves, the output of channel 1 on the master is activated if one or more channels among these amplifiers are activated. Furthermore LT/LR errors and insufficient signal level alarms are indicated on the master alarm output. The **Common Mode Output** is selected on all amplifiers channel 1.

Grouping of modules

All modules with same group number are multiplexed within the group in sequence. If the modules are divided into two or more groups, by setting different group numbers for the modules, the various groups will be multiplexed in parallel. This will reduce the cycle time for the multiplexing, but it must be ensured that the receivers of one group cannot see the transmitters of another group, in order to avoid interference.
The Module Group is selected when setting channel 1 of the module. All modules are default set to group 0.

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